

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Domingue	USFWS: David Wills / Steve Haeseker
OR: Erick Van Dyke	ID: Russ Kiefer / Pete Hassemer
WDFW: Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Andy Miller
Colville: Sheri Sears / Keith Wolf	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Doug Baus / Karl Kanbergs	

TMT MEETING

Wednesday July 10, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 9707

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

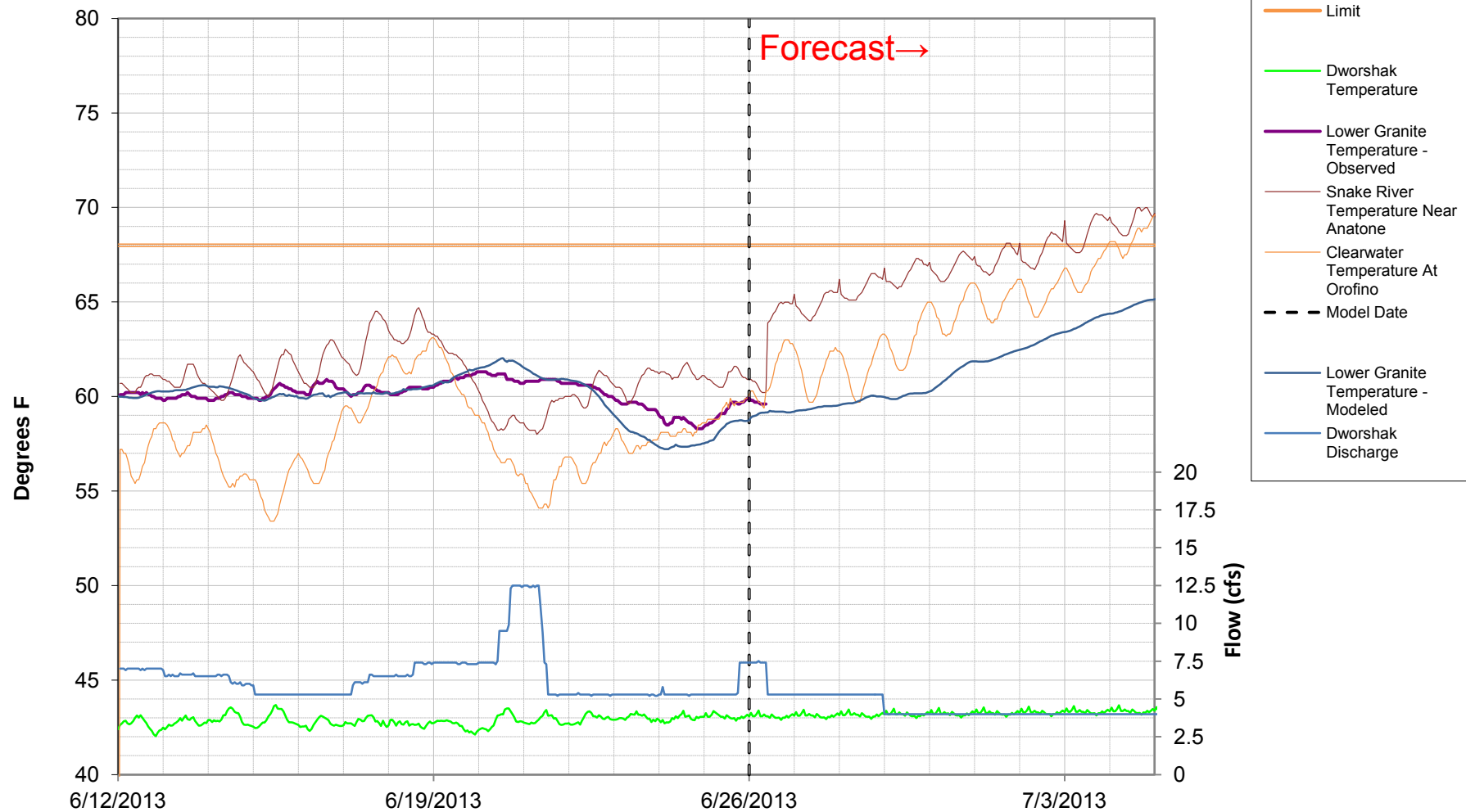
1. Welcome and Introductions
2. Review Meeting Minutes - [June 19](#)
3. Libby Summer Operations - Adam Price, COE-NWS
 - a. [Libby Summer Operations 2013](#)
4. Dworshak Temperature Control Operation - Doug Baus - COE-NWD and Steve Hall - COE-NWW
 - a. [June 26 TMT Coordination](#)
 - b. [July 1 TMT Coordination](#)
 - c. [July 3 TMT Coordination](#)

- d. [July 3 TMT Coordinated SPL to Minimize LWG Tailrace Temps](#)
 - e. [July 8 Temperature Model](#)
 - f. [Current Water Temperature Report](#)
- 5. Treaty Fishing - *Kyle Dittmer - CRITFC*
 - a. [SOR2013-C2](#)
 - b. [SOR2013-C3](#)
- 6. Grand Coulee Refill - *Mary Mellema, BOR*
- 7. Spill Priority List - *Doug Baus, COE-NWD*
 - a. [SPL July 12-August 31](#)
 - b. [July 3 TMT Coordinated SPL to Minimize LWG Tailrace Temps](#)
- 8. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
- 9. Other
 - a. Set agenda and date for next meeting - **July 17, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

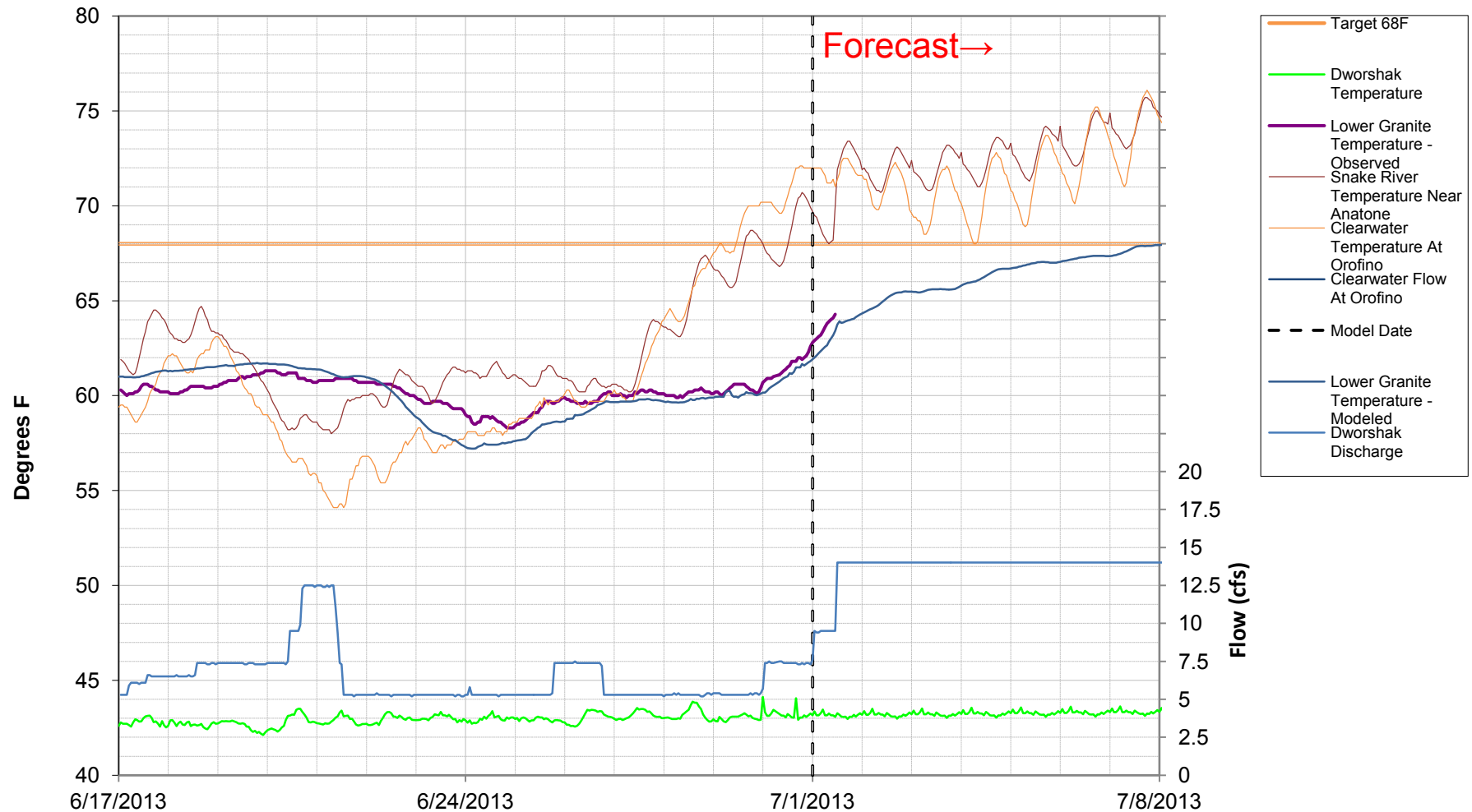
Output from CEQUALUtility Pre-processor
Analog Year 2009 (ORFI +2 ANQW +1)
5.3kcfs till 29th then 4kcfs

Water Temperature Comparisons Model from 6/12/2013 to 7/5/2013 Observed Data to 6/26/2013



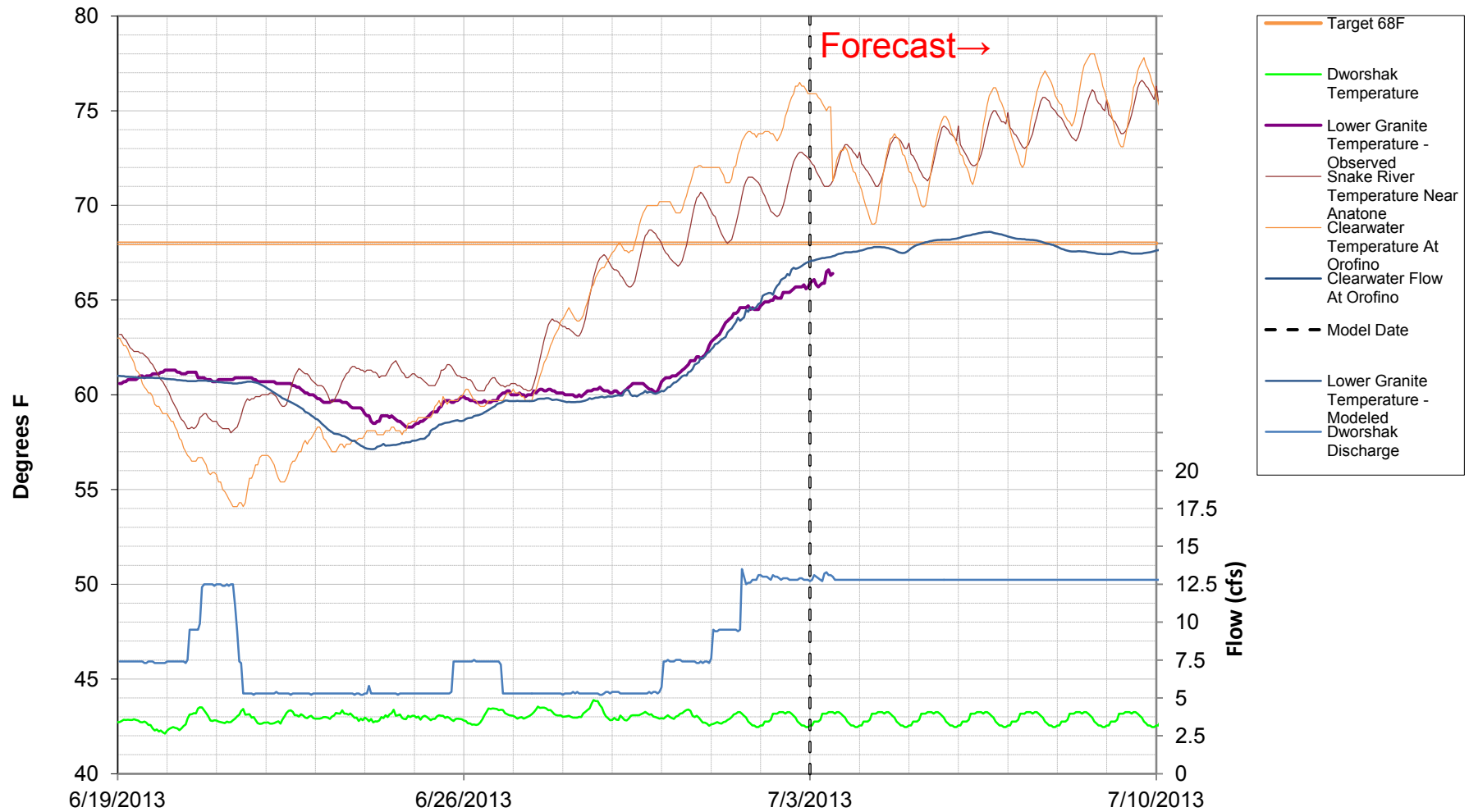
Output from CEQUALUtility Pre-processor
Analog Year 2003 (OFRI +5 ANQW +5)
14 kcfs on 1 JUL (34.0kcfs @ANQW)

Water Temperature Comparisons Model from 6/17/2013 to 7/8/2013 Observed Data to 7/1/2013



Output from CEQUALUtility Pre-processor
Analog Year 2003 (ORFI +6 ANQW +5)
12.8 kcfs on3 JUL (no modification to ANQW)

Water Temperature Comparisons Model from 6/19/2013 to 7/10/2013 Observed Data to 7/3/2013



LEVEL 1 (SPILL TO WATER QUALITY STANDARDS) IF NOT ALL READY SPILLING TO THESE LEVELS AS FOLLOWS:

- 1) IHR UP TO FISH PASSAGE SPILL CAP = 92 KCFS NIGHT/72 KCFS DAY *
- 2) MCN UP TO FISH PASSAGE SPILL CAP = 160 KCFS *
- 3) JDA UP TO FISH PASSAGE SPILL CAP = 120 KCFS *
- 4) TDA UP TO FISH PASSAGE SPILL CAP = 100 KCFS *
- 5) BON UP TO FISH PASSAGE SPILL CAP = 119 KCFS *
- 6) LWG UP TO FISH PASSAGE SPILL CAP = 25 KCFS *
- 7) LMN UP TO FISH PASSAGE SPILL CAP = 21 KCFS *
- 8) LGS UP TO FISH PASSAGE SPILL CAP = 38 KCFS *
- 9) CHJ UP TO 110% = 20 KCFS *
- 10) GCL UP TO 110% TDG LACK OF LOAD SPILL CAP = 0 KCFS (OT); 30 KCFS (DG) *
- 11) DWR UP TO 110% TDG LACK OF LOAD SPILL CAP = 30% TOTAL FLOW

AS MEASURED IN THE TAILWATER AND FOREBAY OF NEXT PROJECT DOWNSTREAM RESPECTIVELY.

LEVEL 2 (SPILL WITHOUT CONSIDERATION OF FOREBAY RESTRICTION) IS AS FOLLOWS:

- 12) IHR UP TO 120% TDG LACK OF LOAD SPILL CAP = 92 KCFS NIGHT/72 KCFS DAY *
- 13) MCN UP TO 120% TDG LACK OF LOAD SPILL CAP = 170 KCFS *
- 14) JDA UP TO 120% TDG LACK OF LOAD SPILL CAP = 146 KCFS *
- 15) TDA UP TO 120% TDG LACK OF LOAD SPILL CAP = 135 KCFS *
- 16) BON UP TO 120% TDG LACK OF LOAD SPILL CAP = 120 KCFS *
- 17) LWG UP TO 120% TDG LACK OF LOAD SPILL CAP = 45 KCFS *
- 18) LMN UP TO 120% TDG LACK OF LOAD SPILL CAP = 44 KCFS *
- 19) LGS UP TO 120% TDG LACK OF LOAD SPILL CAP = 55 KCFS *
- 20) CHJ UP TO 115% TDG AT WELLS FOREBAY LACK OF LOAD SPILL CAP = 60 KCFS *

LEVEL 3 SPILL IS AS FOLLOWS:

- 21) IHR UP TO 122% TDG LACK OF LOAD SPILL CAP = 92 KCFS NIGHT/ 85 KCFS DAY *
- 22) MCN UP TO 122% TDG LACK OF LOAD SPILL CAP = 220 KCFS *
- 23) JDA UP TO 122% TDG LACK OF LOAD SPILL CAP = 177 KCFS *
- 24) TDA UP TO 122% TDG LACK OF LOAD SPILL CAP = 160 KCFS *
- 25) BON UP TO 122% TDG LACK OF LOAD SPILL CAP = 146 KCFS *
- 26) LWG UP TO 122% TDG LACK OF LOAD SPILL CAP = 52 KCFS *
- 27) LMN UP TO 122% TDG LACK OF LOAD SPILL CAP = 60 KCFS *
- 28) LGS UP TO 122% TDG LACK OF LOAD SPILL CAP = 59 KCFS *
- 29) CHJ UP TO 120% TDG LACK OF LOAD SPILL CAP = 115 KCFS *
- 30) GCL UP TO 115% TDG LACK OF LOAD SPILL CAP = 5 KCFS (OT); 32 KCFS (DG) *

LEVEL 4 SPILL IS AS FOLLOWS:

- 31) IHR UP TO 125% TDG LACK OF LOAD SPILL CAP = 110 KCFS
- 32) MCN UP TO 125% TDG LACK OF LOAD SPILL CAP = 230 KCFS
- 33) JDA UP TO 125% TDG LACK OF LOAD SPILL CAP = 190 KCFS
- 34) TDA UP TO 125% TDG LACK OF LOAD SPILL CAP = 269 KCFS
- 35) BON UP TO 125% TDG LACK OF LOAD SPILL CAP = 215 KCFS
- 36) LWG UP TO 125% TDG LACK OF LOAD SPILL CAP = 63 KCFS
- 37) LMN UP TO 125% TDG LACK OF LOAD SPILL CAP = 80 KCFS
- 38) LGS UP TO 125% TDG LACK OF LOAD SPILL CAP = 70 KCFS
- 39) CHJ UP TO 122% TDG LACK OF LOAD SPILL CAP = 160 KCFS
- 40) GCL UP TO 120% TDG LACK OF LOAD SPILL CAP = 15 KCFS (OT); 50 KCFS (DG)

LEVEL 5 SPILL IS AS FOLLOWS:

- 41) IHR UP TO 127% TDG LACK OF LOAD SPILL CAP = 124 KCFS

- 42) MCN UP TO 127% TDG LACK OF LOAD SPILL CAP = 280 KCFS
- 43) JDA UP TO 127% TDG LACK OF LOAD SPILL CAP = 206 KCFS
- 44) TDA UP TO 127% TDG LACK OF LOAD SPILL CAP = 294 KCFS
- 45) BON UP TO 127% TDG LACK OF LOAD SPILL CAP = 234 KCFS
- 46) LWG UP TO 127% TDG LACK OF LOAD SPILL CAP = 85 KCFS
- 47) LMN UP TO 127% TDG LACK OF LOAD SPILL CAP = 120 KCFS
- 48) LGS UP TO 127% TDG LACK OF LOAD SPILL CAP = 95 KCFS
- 49) CHJ UP TO 125% TDG LACK OF LOAD SPILL CAP = 190 KCFS
- 50) GCL UP TO 122% TDG LACK OF LOAD SPILL CAP = 20 KCFS (OT); 60 KCFS (DG)

LEVEL 6 SPILL IS AS FOLLOWS:

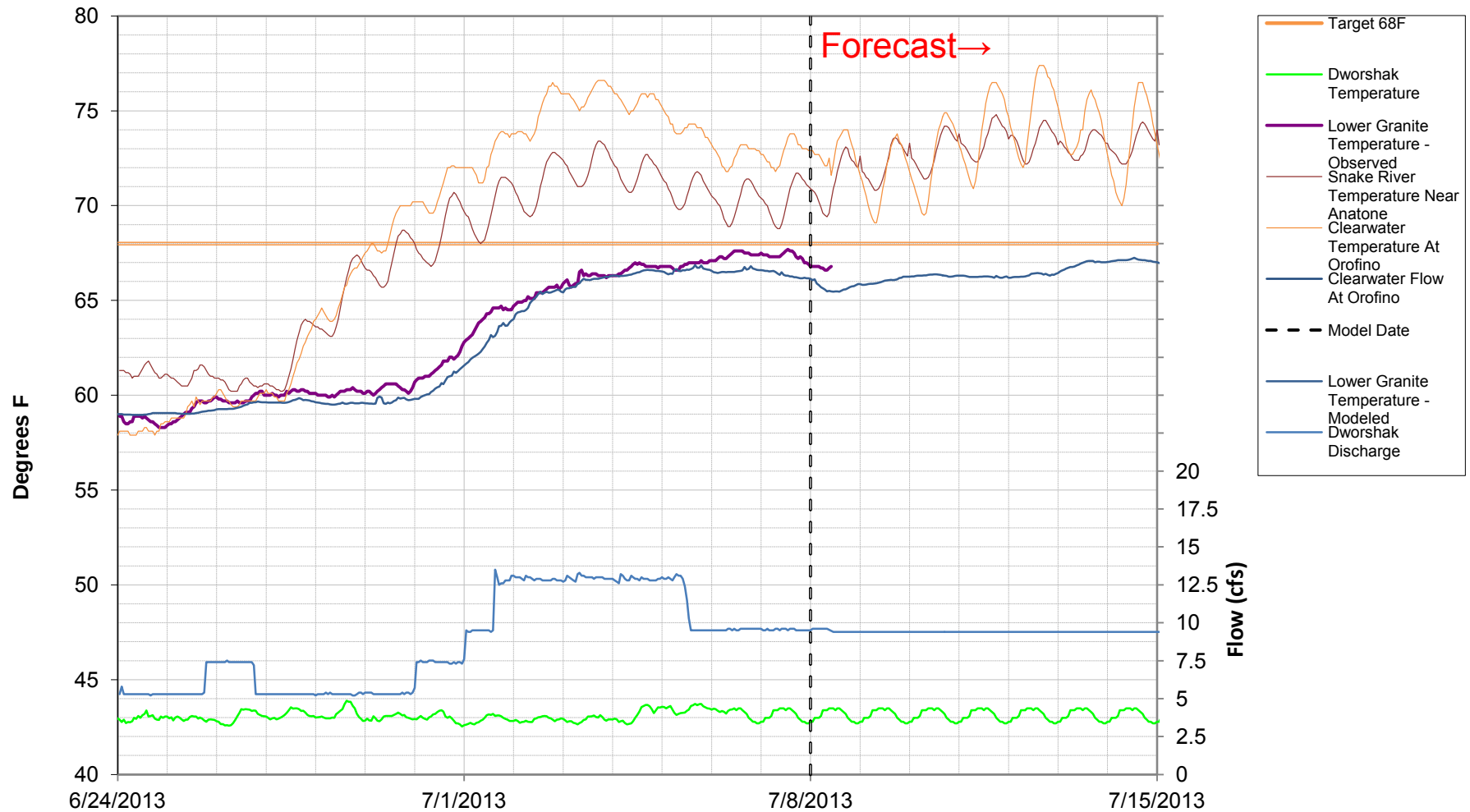
- 51) IHR UP TO 130% TDG LACK OF LOAD SPILL CAP = 145 KCFS
- 52) MCN UP TO 130% TDG LACK OF LOAD SPILL CAP = 321 KCFS
- 53) JDA UP TO 130% TDG LACK OF LOAD SPILL CAP = 250 KCFS
- 54) TDA UP TO 130% TDG LACK OF LOAD SPILL CAP = 360 KCFS
- 55) BON UP TO 130% TDG LACK OF LOAD SPILL CAP = 250 KCFS
- 56) LWG UP TO 130% TDG LACK OF LOAD SPILL CAP = 90 KCFS
- 57) LMN UP TO 130% TDG LACK OF LOAD SPILL CAP = 180 KCFS
- 58) LGS UP TO 130% TDG LACK OF LOAD SPILL CAP = 125 KCFS
- 59) CHJ UP TO 127% TDG LACK OF LOAD SPILL CAP = 250 KCFS
- 60) GCL UP TO 125% TDG LACK OF LOAD SPILL CAP = 25 KCFS (OT); 80 KCFS (DG)

LEVEL 7 SPILL IS AS FOLLOWS:

- 61) IHR UP TO 135% TDG LACK OF LOAD SPILL CAP = 240 KCFS
- 62) MCN UP TO 135% TDG LACK OF LOAD SPILL CAP = 375 KCFS
- 63) JDA UP TO 135% TDG LACK OF LOAD SPILL CAP = 300 KCFS
- 64) TDA UP TO 135% TDG LACK OF LOAD SPILL CAP = 400 KCFS
- 65) BON UP TO 135% TDG LACK OF LOAD SPILL CAP = 300 KCFS
- 66) LWG UP TO 135% TDG LACK OF LOAD SPILL CAP = 200 KCFS
- 67) LMN UP TO 135% TDG LACK OF LOAD SPILL CAP = 250 KCFS
- 68) LGS UP TO 135% TDG LACK OF LOAD SPILL CAP = 177 KCFS
- 69) CHJ UP TO 130% TDG LACK OF LOAD SPILL CAP = 280 KCFS
- 70) GCL UP TO 127% TDG LACK OF LOAD SPILL CAP = 32 KCFS (OT); 93 KCFS (DG)
- 71) CHJ UP TO 135% TDG LACK OF LOAD SPILL CAP = 300 KCFS
- 72) GCL UP TO 130% TDG LACK OF LOAD SPILL CAP = 42 KCFS (OT); 120 KCFS (DG)

Output from CEQUALUtility Pre-processor
Analog Year 2003 (ORFI +3 ANQW +2)
9.4 kcfs 8-15 JUL (25 kcfs @ ANQW 7-16 JUL)

Water Temperature Comparisons Model from 6/24/2013 to 7/15/2013 Observed Data to 7/8/2013



Libby Dam Operations for 2013

Adam Price

Hydraulic Engineer

Seattle District

10 July 2013



US Army Corps of Engineers
BUILDING STRONG®



Storm Recap

- Peak inflow: ~90 kcfs
- Rainfall totals 2"-6" across entire basin.
- Highest single event inflow since completion of the dam.
- Elevated post-storm temperatures delayed recession, melting off snow deposited by storm
- 30 June Lake Koocanusa elevation: 2456.1'
 - ▶ Target elevation 2445 – 2450 ft



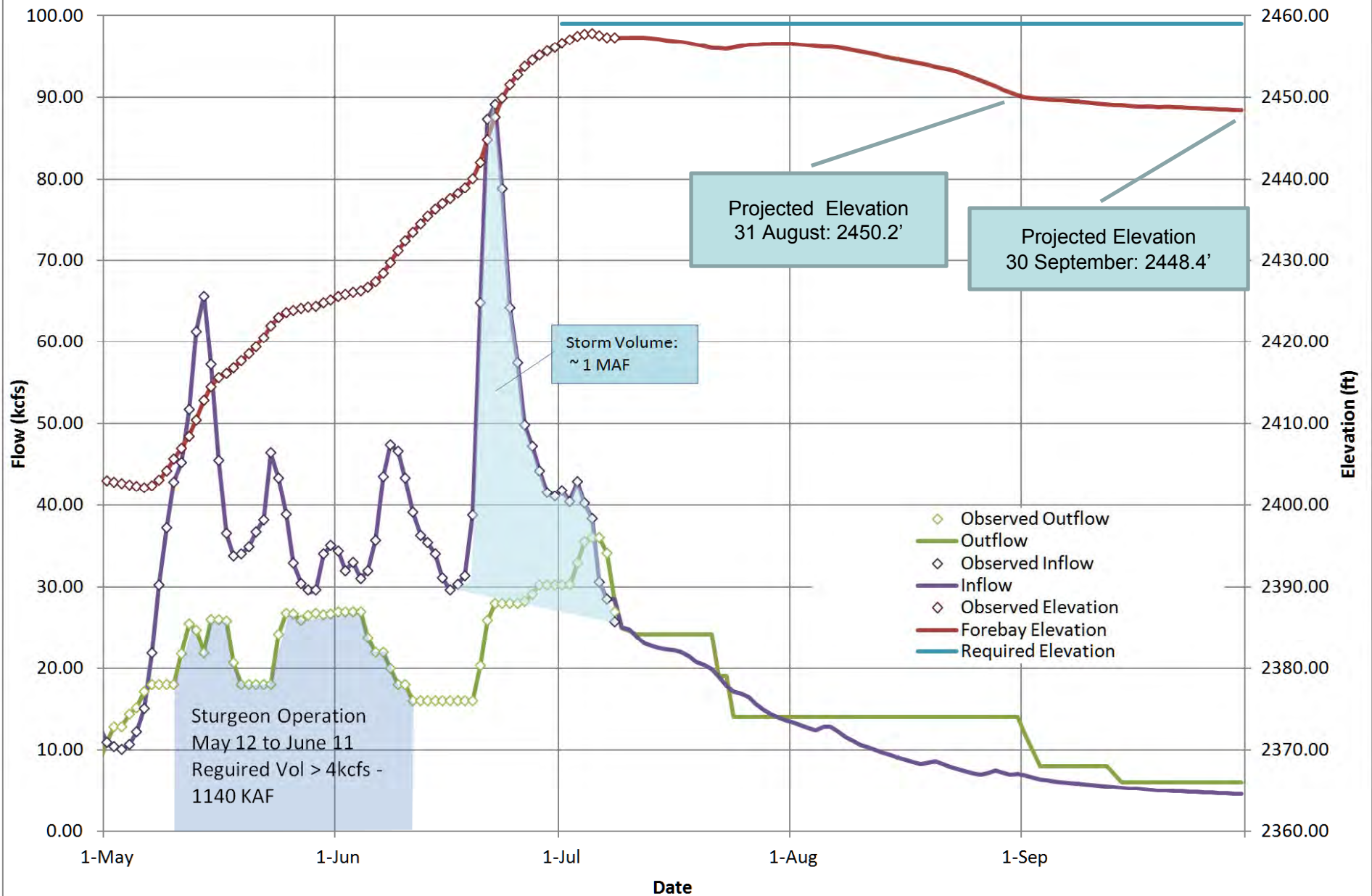
BUILDING STRONG®

Operations

- Current Elevation is 2457.2 ft
(0.25 MAF of Space out of 5 MAF total for Flood Control)
- Currently releasing 24.5 kcfs
- Coming Operations
 - ▶ Summer Operations
 - 31 Aug Lake Koocanusa target elevations 2449.0 – 2451.6 ft
 - ▷ 2 unit outage scheduled to begin July 15th has been moved back to July 22nd.
 - Was originally scheduled for July 15th but pushed back after extreme precipitation
 - ▷ Anticipate releasing reduced powerhouse capacity for remainder of July and August.
 - ▷ No double peak to chase precipitation events to meet target range
 - For September support Kootenai Tribe Habitat Work
 - ▷ If Koocanusa elevation > 2449 ft on 31 Aug release 8 kcfs until reached or 30 Sept
 - ▷ Once 2449 ft is reached in Sept ramp to 6 kcfs for remainder of the month



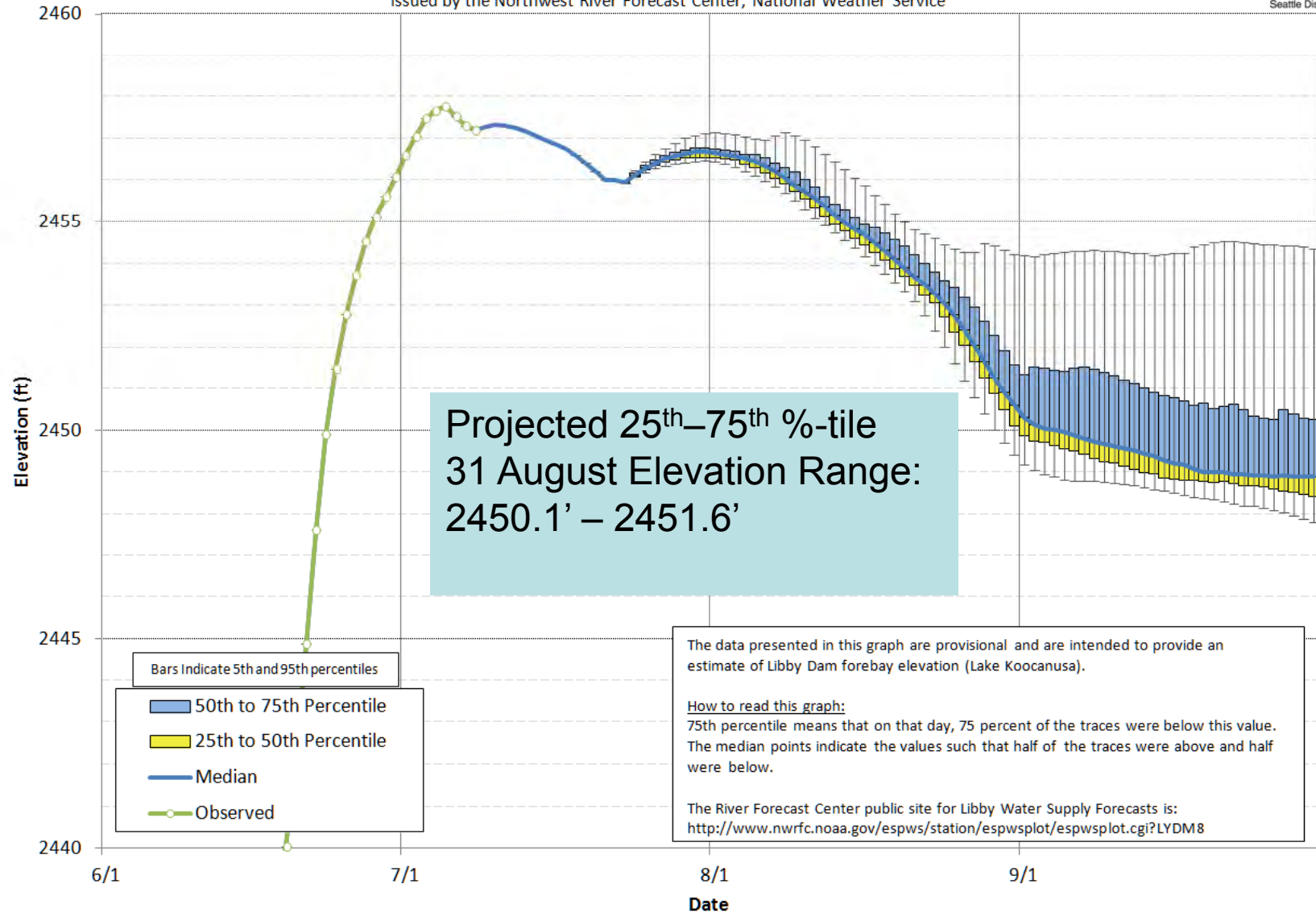
Sample Lake Koocanusa Operations 2013



Modeled using current ESP traces as of 07/09/13

Lake Koocanusa Elevation - Probability Chart

Corps of Engineers Projections Based on the 53 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service



Summary of 2013

- Extreme rainfall in late June filled space held in reserve.
- Peak elevation in early July (2457.8')
- Unit outage beginning July 22 will reduce powerhouse capacity to ~14 kcfs.
- Once unit outage is underway and until 31 Aug hold 14 kcfs until elevation at Libby Dam reaches 2450.0', then adjust release to target 2449 ft on 31 Aug
- Maintain previous S.O.R.:
 - ▶ Anticipate the 31 Aug target range is 2449 ft to 2451.6 ft
 - ▶ Release 8 kcfs in September until the reservoir elevation reaches 2449 ft, then ramp down to 6 kcfs



Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

July 10, 2013

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of NOAA, Oregon, COE, BPA, Washington, Idaho, Montana, CRITFC/Umatilla Tribe, Colville Tribe, Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of June 19 Meeting Minutes

There were no comments on the June 19 meeting notes or official minutes. They will be considered final unless future concerns are raised.

3. Libby Summer Operations Update

Adam Price, COE Seattle, gave a presentation linked to today's agenda. In June, intense rain across the basin in the U.S. and Canada put Libby inflows in the top 10 historically since the dam was built. Lake Koocanusa was at elevation 2451.6 feet when the storm ended. When warm temperatures added snowmelt to the system, lake elevation peaked at 2457.8 feet. Thus Libby ended the month at 2456.1 feet, which was 6 feet above the target end of June elevation of 2445 - 2450 feet. This is why the COE saves space for flood control in reservoirs, Price noted.

Current Libby elevation is 2457.15 feet, a quarter MAF from full, releasing 24.5 kcfs. As previously coordinated with the TMT the COE still intends to target an August 31 elevation of 2449- 2451.6 feet at Lake Koocanusa in order to implement SOR 2013-01 Kootenai River Habitat Restoration Project. From July 22 through September 16, a two-unit outage will limit Libby powerhouse discharges to 14 kcfs. The COE plans to maintain 14 kcfs releases through end August. If reservoir elevation reaches 2450 feet during August, the corps may adjust (reduce) outflow to target 2449 feet or above on August 31st. In order to facilitate the Kootenai Tribe's habitat work in September the Corps will implement the following operation: 1) Target 2449 ft to 2451.6 ft on August 31, and 2) Release 8 kcfs in September if necessary to reach reservoir elevation 2449 ft, then ramp down to 6 kcfs. Discharge would be held at powerhouse capacity in July and August and the Corps would not double-peak in order to reach the target end of August (2449-2451.6 feet) and/or September (2449 feet) elevations in order to chase precipitation events.

Paul Wagner, NOAA, and Jim Litchfield, Montana, approved of this plan. Montana would prefer to hold 14 kcfs out until end August regardless of elevation, Litchfield noted. Managing to elevation 2451.6 feet could drive actions that would adversely affect river conditions. Price said the COE intends to hold 14 kcfs out through end August regardless of precipitation, unless the pool reaches 2450 feet, in which case flow reduction may be made to target 2449 feet or above. The COE will continue to provide TMT with updates on the Libby summer operation.

4. Dworshak Temperature Control Operation

Since TMT last met on June 19, the COE sent TMT members several emails to coordinate Dworshak operations, Baus recalled. The information is shown in several attachments to this item on today's agenda. Attachment 4d is an amended spill priority list with Lower Granite lower in priority. Amending the spill priority list to move Lower Granite lower helped to reduce temperatures in the Lower Granite tailwater. The COE continues to maintain water temperatures at or below the water quality standard of 68 degrees in Lower Granite tailwater in accordance with the BiOp.

However, moving Lower Granite down on the spill priority list allows heat to build up in the forebay, which impacts the ability to manage temperatures in the future, Russ Kiefer, Idaho, pointed out. Steve Hall, COE Walla Walla, said the COE is keeping an eye on this situation. Wind events are common at this time of year, and data suggest that colder water is being moved downstream without mixing. The model accounts for the effect of differing levels of spill on Lower Granite tailwater conditions.

Dave Statler, Nez Perce, asked whether there are any options to manage water temperatures at Lower Granite beyond the current operation associated with Dworshak operations and moving Lower Granite lower on the spill priority list. Hall replied there are no other operations to reduce temperatures in the Lower Granite Dam tailwater. Charles Morrill, Washington, noted that Hells Canyon releases are an important factor that is beyond the COE's control.

The model, based on 2003 and 2009 as analog years, is currently under-predicting the temperature in Lower Granite tailwater by about 1 degree F, Hall said. The model indicates that a full powerhouse discharge of 9.4 kcfs should be sufficient through July 12-13. Since the model has been under-predicting, the COE added 1.5 kcfs spill at Dworshak this morning in an attempt to avoid a temperature exceedance at Lower Granite.

At current flows, it takes about 3-4 days for cooler water from Dworshak to reach Lower Granite, Hall reported. Only about a week of full gas cap spill above powerhouse capacity remains at Dworshak through the end of August. There will be little flexibility in the amount of water available over powerhouse capacity at

any given time. That is the reason the COE is making every effort this year to conserve water.

Hall said the question is: Keep the water cool now and risk exceeding temperatures later in August, or exercise a little more risk now (getting closer to 68 degrees with potential of exceeding) in order to conserve the cooler water for later? This is not so much a question to be answered today as recognition that it will be a balancing act.

The Salmon Managers did not talk about this in yesterday's FPAC call, Wagner replied. However, he said no caucus was needed today because the COE's plan to operate Dworshak releases to maintain the Lower Granite tailrace temperature at no more than 68 degrees F as a daily average is acceptable.

Hall will email TMT members weekly modeling graphs of Dworshak operations on an ongoing basis.

5. Treaty Fishing – SOR2013-C-2 and SOR2013-C-3

CRITFC has submitted two SORs to the COE which are attached to today's agenda. They are identical except for the dates: SOR2013-C-2 requests an operation of 1.5 foot elevation bands in the Bonneville, The Dalles and John Day pools for treaty fishing from July 1-3. SOR2013-C-3 makes the same operational request from July 8-11. There are 326 nets in the Columbia now, , Kyle Dittmer, CRITFC, reported. That's about 31% in the Bonneville pool, 25% in The Dalles pool, and 44% in John Day pool since the summer emphasis has shifted upstream to John Day.

The COE implemented the request made in SOR2013-C-2 and is currently operating in accordance with SOR2013-C-3, Baus said. Dittmer thanked the COE and BPA for keeping the three lower river pools enormously stable over the past week, with fluctuations of only 0.5-1 feet. The fishers appreciated that.

6. Grand Coulee Refill

Current Grand Coulee elevation is 1288.9 feet, Mary Mellema, BOR, reported. The project is headed toward refill at 1289.8 feet probably tomorrow. Once the pool touches full, BiOp draft for summer flows will begin.

7. Spill Priority List

The current spill priority list, shown in attachment 7a, is similar to the list used previously for this time of year, Baus said. Spill starts upstream on the Snake River at Lower Granite and moves downstream. Attachment 7b shows the special operation at Dworshak that TMT coordinated to minimize temperatures by moving Lower Granite lower on the list. The rationale for that was to reduce

lack of load spill at Lower Granite Dam, which would reduce temperatures in the tailwater. Looking ahead, the COE does not expect any more lack of load spill this summer, so Lower Granite is back in its usual position at the top of the current list. Baus asked TMT members for comments and suggestions.

The Salmon Managers agreed to move Lower Granite back up on the list now that lack of load spill is unlikely, Wagner said. The Salmon Managers present at today's meeting approved the order (Level 1: LWG, LGS, LMN, IHR, MCN, JDA, TDA, BON, CHJ, GCL, and DWR) in attachment 7a, which will be in effect July 12-August 31. TMT will revisit spill priorities when the winter list goes into effect.

8. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3559.4 feet and probably near maximum storage, with releases of 3 kcfs. Soon it will begin drafting slowly. Grand Coulee was covered under agenda item 6 today. Libby is at elevation 2457.2 feet, with daily average inflows of 23.6 kcfs and daily average discharge of 25 kcfs. Albeni Falls is at elevation 2062.3 feet, with inflows of 26 kcfs and releases of 24.1 kcfs. Dworshak is at elevation 1592.9 feet, with inflows of 2.1 kcfs and releases of 9.6 kcfs.

McNary daily average inflows are 227.3 kcfs. Lower Granite daily average inflows are 37.5 kcfs. Bonneville daily average inflows are 225.7 kcfs. The Corps is closely monitoring observed and forecasted Snake River flows so that low flow operations at Little Goose can be implemented in accordance with the 2013 FOP. When flows decrease to ≤ 32 kcfs, the Corps will transition Little Goose from 30% spill to a constant spill level of 7-11 kcfs, Baus said. There is a discrepancy between the 2013 Fish Passage Plan (FPP) and the FOP describing this operation. As a point of clarification the Corps will implement the operation as described in the FOP. Once inflows reach ≤ 32 kcfs, the Corps will implement this change in real time, which may occur prior to the next TMT meeting.

b. Fish. Adults: To date, 75,981 summer chinook have passed Bonneville, which is 105% of the 10 year average. The summer chinook jack count of 22,653 is 159% of the 10 year average. Both spring and summer chinook jack counts are well above average this year. Sockeye counts at 161,000 to date are 96% of the 10 year average. Lamprey returns at Bonneville are only 63% of the 10 year average, with 104,000 passing to date.

At Ice Harbor, summer chinook passage of 9500 fish to date is only 62% of the 10 year average. The summer chinook jack count is 5500 so far. Sockeye passage of 592 fish is 230% of the 10 year average. Russ Kiefer said Idaho's data indicate adult returns to the Stanley Basin are good this year, with 62 PIT tag detections at Ice Harbor and 183 PIT tag detections at Bonneville.

Juveniles: Subyearling chinook passage is where the action is. Passage at Lower Granite is holding steady at about 5000 fish per day. Little Goose is passing around 6000 per day and Lower Monumental, 1000 per day. Subyearling passage at McNary peaked at 382,000 a week ago. Juvenile lamprey passage is winding down, with counts to date of 4300 at McNary and 900 at John Day.

c. Water Quality. Laura Hamilton, COE, showed TMT the latest TDG data, focusing on the Oregon standard of 12-hour averages which are currently in effect. There have not been many exceedances over the past several days, except for some morning lack of load spill on the Snake. In June the McNary tailwater gage broke, resulting in a 12 hour average TDG reading of 154.8%. The gage has been repaired.

d. Power System. There was nothing to report.

6. Next TMT Meeting

The next TMT meeting in person will be July 24, with an agenda similar to today's agenda.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Paul Wagner	NOAA
Erick Van Dyke	Oregon
Lisa Wright	COE
Scott Bettin	BPA
Charles Morrill	Washington
Steve Hall	COE
Tony Norris	BPA
Agnes Lut	BPA
Laura Hamilton	COE
Karl Kanbergs	COE
Emily Plummer	DS Consulting

<i>Phone:</i>	
Russ Kiefer	Idaho
Jim Litchfield	Montana
Sheri Sears	Colville
Adam Price	COE Seattle
Dave Statler	Nez Perce
Mary Mellema	BOR
Heather Dohan	Puget Power
Margaret Filardo	FPC
Greg Lawson	Thompson Reutters
Barry Espenson	CBB
Bruce McKay	hydro consultant

Richelle Beck
Shane Scott
XX

Grant PUD
PPC
DTE Energy Traders



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 NE Oregon, Suite 200, Portland, Oregon 97232

Telephone 503 238 0667

Fax 503 235 4228

SYSTEM OPERATIONAL REQUEST: 2013 C-2

TO:	Gen. Anthony Funkhouser	COE-NWD
	James D. Barton	COE-NWD-NP-Water Management
	Karl Kanbergs, Douglas Baus	COE-NWD-NP-WM-RCC
	D. Feil, R. Peters, D. Ponganis	COE-NWD-PDD (Fish Management Office)
	JR Inglis/Paul Cloutier	COE-Portland District/NWD (Tribal Liaison)
	Lorri Lee	USBR- PNW Regional Director
	Bill Drummond	BPA Administrator
	Steve Oliver, Greg Delwiche	BPA-PG-5
	Scott Bettin, Tony Norris	BPA-Operations Planning-PGPO
	Stan Speaks, Keith Hatch	BIA, Northwest Regional Office

FROM: B. Paul Lumley, *Executive Director*

DATE: June 27, 2013

SUBJECT: **Operation of the Lower Columbia Pools for the Summer 2013 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the summer 2013 Treaty fishery. This effort supports the 2013 ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

July 1, 2013, 6 am, Monday, through 6 pm, July 3, 2013, Wednesday.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

JUSTIFICATION:

The 2013 summer treaty fishing season is of critical importance to CRITFC's member tribes. The escapement (Columbia at Bonneville Dam) of an estimated of **73,500** (above average) adult summer Upper Columbia Chinook and **180,350** sockeye (above average) will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day. The June 25, 2013 survey showed 373 nets in the Zone 6 pools, as follows: 164 (44%) in Bonneville, 82 (22%) in The Dalles, and 127 (34%) in John Day

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become "ghost nets" that continue to catch fish and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB, Friday June 28, 2013. Thank you for considering this request. Please contact Kyle Dittmer or Stuart Ellis should you have any questions at (503) 238-0667.

cc: Tribal staffs and attorneys



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 NE Oregon, Suite 200, Portland, Oregon 97232

Telephone 503 238 0667

Fax 503 235 4228

SYSTEM OPERATIONAL REQUEST: 2013 C-3

TO:	Gen. Anthony Funkhouser	COE-NWD
	James D. Barton	COE-NWD-NP-Water Management
	Karl Kanbergs, Douglas Baus	COE-NWD-NP-WM-RCC
	D. Feil, R. Peters, D. Ponganis	COE-NWD-PDD (Fish Management Office)
	JR Inglis/Paul Cloutier	COE-Portland District/NWD (Tribal Liaison)
	Lorri Lee	USBR- PNW Regional Director
	Bill Drummond	BPA Administrator
	Steve Oliver, Greg Delwiche	BPA-PG-5
	Scott Bettin, Tony Norris	BPA-Operations Planning-PGPO
	Stan Speaks, Keith Hatch	BIA, Northwest Regional Office

FROM: B. Paul Lumley, *Executive Director*

DATE: July 3, 2013

SUBJECT: **Operation of the Lower Columbia Pools for the Summer 2013 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the summer 2013 Treaty fishery. This effort supports the 2013 ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

July 8, 2013, 6 am, Monday, through 6 pm, July 11, 2013, Thursday.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

JUSTIFICATION:

The 2013 summer treaty fishing season is of critical importance to CRITFC's member tribes. The escapement (Columbia at Bonneville Dam) of an estimated of **56,000** (near average) adult summer Upper Columbia Chinook and **154,000** sockeye (above average) will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day. The July 2, 2013 survey showed 326 nets in the Zone 6 pools, as follows: 116 (36%) in Bonneville, 98 (30%) in The Dalles, and 112 (34%) in John Day

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become "ghost nets" that continue to catch fish and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB, Monday July 8, 2013. Thank you for considering this request. Please contact Kyle Dittmer or Stuart Ellis should you have any questions at (503) 238-0667.

cc: Tribal staffs and attorneys

SPILL PRIORITY LIST Effective July 12 – August 31

If necessary to spill above FOP spill rates, the Action Agencies will incrementally increase spill at projects in the following priority order. This spill priority list is intended to manage TDG levels on a system-wide basis while prioritizing extra spill in a manner that provides the most benefit to fish passage.

The order may be adaptively managed in-season based on feedback and recommendations from TMT.

Level	Priority Order	Project	TDG %	Spill Cap Estimate (kcfs)
LEVEL 1 – up to State TDG Standards ¹	01	LWG	120/115%	40
	02	LGS	120/115%	38
	03	LMN	120/115%	26 (Bulk)
	04	IHR	120/115%	92 night / 75 day
	05	MCN	120/115%	190
	06	JDA	120/115%	142
	07	TDA	120/115%	115
	08	BON	120/115%	121
	09	CHJ	110%	21
	10	GCL	110%	0 (OT) or 30 (DG) ²
	11	DWR	110%	30% of total river flow
LEVEL 2 – removes downstream forebay restriction	12	LWG	120%	45
	13	LGS	120%	55
	14	LMN	120%	44
	15	IHR	120%	92 night / 75 day
	16	MCN	120%	209
	17	JDA	120%	146
	18	TDA	120%	135
	19	BON	120%	120
	20	CHJ	120% ³	60
LEVEL 3	21	LWG	122%	52
	22	LGS	122%	59
	23	LMN	122%	60
	24	IHR	122%	92 night / 85 day
	25	MCN	122%	185
	26	JDA	122%	177
	27	TDA	122%	160
	28	BON	122%	140
	29	CHJ	120%	115
	30	GCL	115%	5 (OT) or 40 (DG)
LEVEL 4	31	LWG	125%	63
	32	LGS	125%	70
	33	LMN	125%	80
	34	IHR	125%	110
	35	MCN	125%	230
	36	JDA	125%	190

Level	Priority Order	Project	TDG %	Spill Cap Estimate (kcfs)
	37	TDA	125%	269
	38	BON	125%	215
	39	CHJ	122%	160
	40	GCL	120%	15 (OT) or 50 (DG)
LEVEL 5	41	LWG	127%	85
	42	LGS	127%	95
	43	LMN	127%	120
	44	IHR	127%	124
	45	MCN	127%	280
	46	JDA	127%	206
	47	TDA	127%	294
	48	BON	127%	234
	49	CHJ	125%	190
	50	GCL	122%	20 (OT) or 60 (DG)
LEVEL 6	51	LWG	130%	90
	52	LGS	130%	125
	53	LMN	130%	180
	54	IHR	130%	145
	55	MCN	130%	321
	56	JDA	130%	250
	57	TDA	130%	360
	58	BON	130%	250
	59	CHJ	127%	250
	60	GCL	125%	25 (OT) or 80 (DG)
LEVEL 7	61	LWG	135%	200
	62	LGS	135%	177
	63	LMN	135%	250
	64	IHR	135%	240
	65	MCN	135%	375
	66	JDA	135%	300
	67	TDA	135%	400
	68	BON	135%	300
	69	CHJ	130%	280
	70	GCL	130%	42 (OT) or 120 (DG)

1. During Fish Passage Season (Apr 1–Aug 31), state TDG standards for the eight Lower Snake and Lower Columbia fish passage projects are $\leq 120\%$ in the tailrace OR $\leq 115\%$ at the next downstream forebay (whichever is more restrictive). The standard at all other projects is $\leq 110\%$ year-round.

2. Spill at GCL is either through outlet tubes (OT) or drum gates (DG), depending on reservoir elevation. Spill through OT produces more TDG. Spill transitions to drum gates at forebay elevation of 1267-1270 feet.

3. CHJ Level 2 spill shaped to 115% in the Wells Dam forebay, up to 120% in the CHJ tailrace, depending on anticipated duration.

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Domingue	USFWS: David Wills / Steve Haeseker
OR: Erick Van Dyke	ID: Russ Kiefer / Pete Hassemer
WDFW: Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Andy Miller
Colville: Sheri Sears / Keith Wolf	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Doug Baus / Karl Kanbergs	

TMT CONFERENCE CALL (UNSCHEDULED)

Monday, July 22, 2013 2:30pm - 3:30pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 0374

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

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AGENDA

1. LWG Special Operation for Adult Fish Passage - Russ Kiefer, Idaho
 - a. [LWG Temperatures - Adult Trap, Daily Average March 8 - July 15](#)
 - b. [LWG Temperatures - Ladder Exit, Hourly Average July 19 1400 hours - July 22 0900 hours](#)

*Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995*

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

Monday, July 22, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference call was chaired by Karl Kanbergs, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, Montana, Idaho, BOR, NOAA, CRITFC/Umatilla, Oregon, Washington, Salish-Kootenai Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lower Granite Special Operations for Adult Fish Passage

Russ Kiefer, Idaho, described the need for today's unscheduled TMT call. Adult sockeye appear to be delayed by a thermal block at the entrance to the ladder at Lower Granite Dam. The problem appeared late last week with a count differential of about 350 adult sockeye that have passed Little Goose but not Lower Granite. Current data indicate the temperature in the Lower Granite ladder is slightly above 72 degrees F, while the tailrace is only 67 degrees F due to flow augmentation from Dworshak Dam.

The temperature disparity increased over the weekend concurrent with a significant decline in adult fish passage, so FPAC members conferred in a call today that generated several possible fixes, two of which FPAC recommended in a combined approach (options 1 and 2).

The options the Salmon Managers have considered are:

1. Shut off spill to the RSW, using Unit 1 as first priority, turbine 2 as second priority and turbine 3 as third priority. Unit 1 hasn't been used recently because the blades are welded at a fixed angle that requires the unit to run at the upper end of 1% (approximately 17 kcfs). By prioritizing unit 1 on the southern end of the powerhouse and spilling through the RSW in spillbay 1 on the southern end of the spillway, the Salmon Managers hope to break up warm water stratification in the southern forebay, which provides water to the only adult ladder at Lower Granite.
2. As a companion operation to option 1, operate one unit at speed-no-load (approximately 5 kcfs) with all the other units off and spilling the remainder of inflow up to but not to exceed the total dissolved gas (TDG) spill cap (currently 25 kcfs). This is the same operation the COE has planned for August to accommodate powerhouse roof repairs at Lower Granite. The Salmon Managers hope that increasing spill this way alternating with

option 1 will be sufficient to break up thermal stratification in the forebay and get adult sockeye moving upstream.

3. In addition to implementing options 1 and 2 in tandem, the Salmon Managers recommended cycling the navigation locks at Lower Granite to reduce the temperature differential and encourage sockeye to move.
4. If the above short term options don't work, the Salmon Managers requested that the COE develop a longer term plan to lower temperatures by pumping cold water into the ladder and/or reducing the volume of flows into the ladder entrance.
5. With temperatures high on the Salmon River as well as the Snake, IDFG has been asked to examine the feasibility of setting up a trap and haul operation to move adult sockeye upriver from the Lower Granite ladder to Eagle Hatchery. If this option is implemented, the Salmon Managers would prefer to maintain a maximum trap sample rate of 20%. This is due to concerns about overloading the trap with adult Chinook and steelhead and delaying them in order to trap sockeye.

Prior to today's meeting, the Action Agencies conferred on a proposed operation to implement tonight if TMT achieves consensus on it today, Lisa Wright, COE, said. The FPAC recommendation is to spill through the RSW only, which would pass approximately 6-9 kcfs, then operate Unit 1 which passes about 18 kcfs due to its fixed-blade status. Any additional flows would pass through Units 2 and 3 in that order as requested by FPAC.

Tony Norris, BPA, asked whether recent ladder temperatures have been archived, particularly during the Lower Granite spill operation of July 15-16. Margaret Filardo, FPC, reported there are no data prior to July 19 because the data loggers in the ladder overloaded. IDFG has hourly data on temperatures in the adult trap holding pen, which reflects temperatures in the ladder. Kiefer said he will email this data to TMT members.

Wright asked TMT members who had participated in the FPAC call whether there are any concerns with implementing the proposed test (option 1). Laura Hamilton, COE, expressed concern that flows over 30 kcfs at Lower Granite would exceed the spill cap if one unit is operated at speed-no-load of 5 kcfs. She emphasized that the COE cannot deliberately violate state water quality standards and recommended limiting the speed-no-load operation to 12 hours because a longer duration might exceed the gas cap. If the test is limited to 12 hours, the spill cap could be raised from 25 to 28 kcfs.

There was discussion of whether the temperature differentials at Granite should be addressed by reducing cooler outflows from Dworshak. The current forecast shows temperatures will drop this coming weekend, Kanbergs said.

Implementing the speed-no-load option would mean spilling in excess of the FOP summer spill rate of 18 kcfs.

TMT members expressed their views of the situation:

- **Idaho** – This is a critical condition for endangered sockeye; remedial action is urgently needed. Options 1 and 2 should be tested in tandem for at least 12-15 hours because both remedies might be necessary to make a difference. Supported the COE proposal to limit the speed-no-load test operation to 12 hours so the spill cap can be raised to 28 kcfs.
- **Oregon** – Supports the FPAC recommendation. While spill needs to increase, readings in excess of 125% TDG in the LWG forebay should be avoided.
- **BPA** – Before deciding whether to implement option 2, the Action Agencies need time to review existing data, particularly ladder temperatures during the full spill operation of July 15-16. Expressed willingness to consider reducing Dworshak flow augmentation if that would help alleviate the temperature disparity.
- **Washington** – Ladder temperatures need to be monitored closely because fish don't move well when temperatures exceed 70 degrees F. Supported the COE proposal to limit the speed-no-load spill test to 12 hours so the spill cap can be raised to 28 kcfs.

Because there were no objections to option 1, the Action Agencies will implement it tonight. The Action Agencies agreed to consider all of the options and reconvene tomorrow after they have had time to review existing data.

3. Next TMT Meeting

A conference call was scheduled for 11 am tomorrow for further discussion of the situation at Lower Granite.

Name	Affiliation
Karl Kanbergs	COE
Dan Feil	COE
Laura Hamilton	COE
Lisa Wright	COE

Phone:

Tony Norris	BPA
Jim Litchfield	Montana
Russ Kiefer	Idaho
John Roache	BOR

Scott Bettin	BPA
Ann Setter	COE Walla Walla
Agnes Lut	BPA
Richelle Beck	Grant PUD
Barry Espenson	CBB
Tom Lorz	CRITFC/Umatilla
Erick Van Dyke	Oregon
Trevor Conder	NOAA
Charles Morrill	Washington
Stu Leavitt	Salish Kootenai
Bill Hevlin	NOAA

TECHNICAL MANAGEMENT TEAM

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Colville: Sheri Sears / Keith Wolf	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Doug Baus / Karl Kanbergs	

TMT CONFERENCE CALLS (UNSCHEDULED)

Tuesday, July 23, 2013 11:00am - 12:00pm / 3:30pm - 4:30pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

11:00am Security Code 0374

3:30pm Security Code 1234

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AGENDA

1. Review of LWG Special Operation for Adult Fish Passage - Doug Baus, Corps; Russ Kiefer, Idaho
 - a. [LWG Hourly Project Operations Data, July 22-23](#)
 - b. [Temperature at LWG Adult Ladder Exit \(hourly through July 23 09:00\)](#)
 - c. [Adult Passage Data \(Fish Passage Center Website\)](#)
 - d. [Adult Passage Data \(hourly\) - July 23](#)
 - e. [SOR 2013-4 - Lower Granite Adult Ladder Temperature Issues](#)

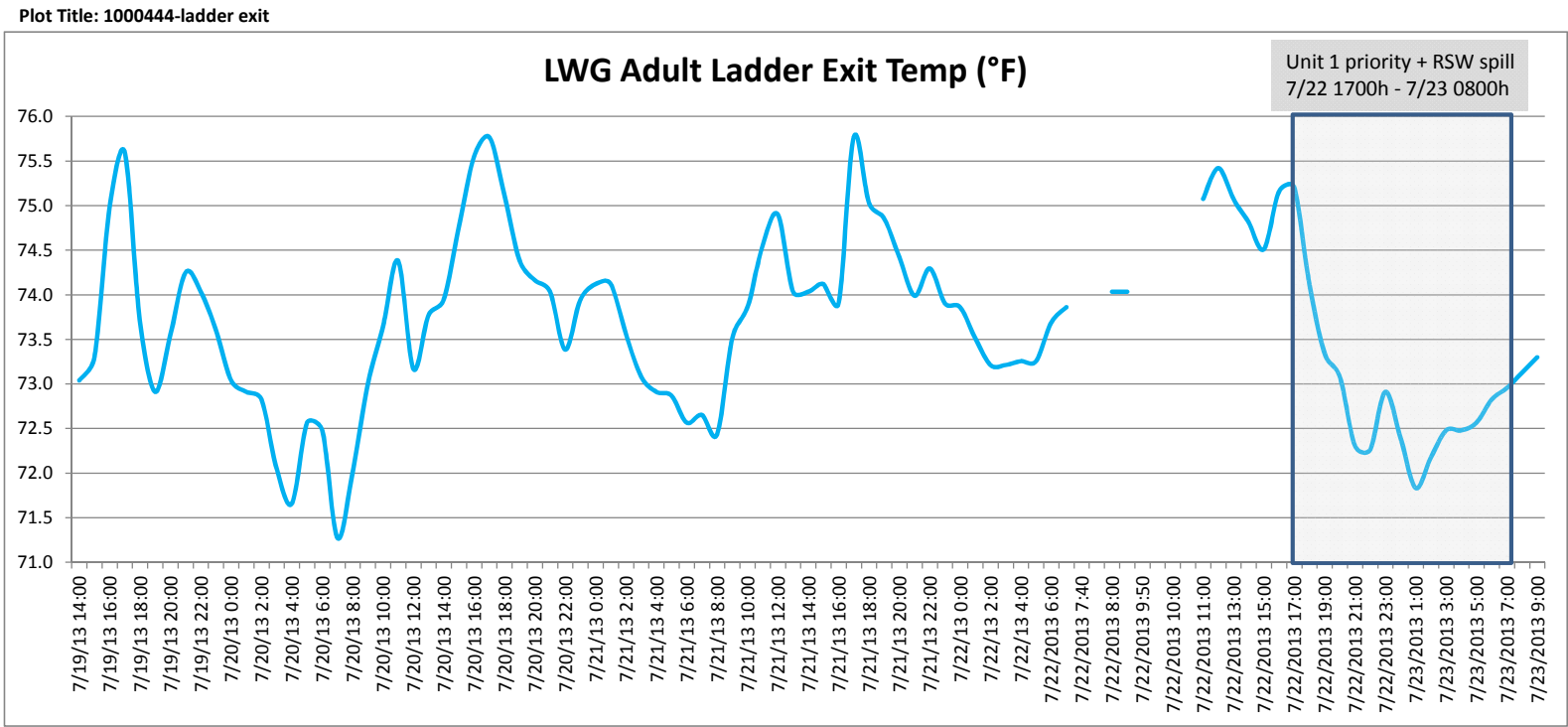
*Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995*

Daily Report LGR T

7/23/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	skad	lamprey	all pk	all ke
1	8	0	6	0	0	0	0	0	0	0	0	0			1	0	1	0
2	20	-17	12	-9	1	-1	1	0	0	0	0	0			0	0	0	0
3	29	-24	33	-14	7	-1	3	-1	1	0	0	0			1	0	0	0
4	17	-20	23	-28	2	-1	1	0	0	0	0	0			1	-1	0	0
5	4	-5	1	-7	1	-3	1	-1	0	0	0	0			3	0	0	0
6	7	-14	2	0	2	0	1	-1	0	0	0	0			3	0	0	0
7	2	-5	0	0	0	-1	0	0	0	-1	0	0			2	0	0	0
8	5	-5	0	-2	6	-2	2	0	0	0	1	0			6	0	0	0
Su	2		17		10		6		0		1				16		1	
Total	2		20		12		7		0		1				19		1	
* 1.2:																		

#	Date Time (PST)	Temp (°F)
	7/19/13 14:00	73.04
	7/19/13 15:00	73.30
	7/19/13 16:00	74.99
	7/19/13 17:00	75.59
	7/19/13 18:00	73.69
	7/19/13 19:00	72.91
	7/19/13 20:00	73.56
	7/19/13 21:00	74.25
	7/19/13 22:00	74.03
	7/19/13 23:00	73.60
	7/20/13 0:00	73.04
	7/20/13 1:00	72.91
	7/20/13 2:00	72.83
	7/20/13 3:00	72.05
	7/20/13 4:00	71.66
	7/20/13 5:00	72.57
	7/20/13 6:00	72.48
	7/20/13 7:00	71.27
	7/20/13 8:00	72.01
	7/20/13 9:00	73.00
	7/20/13 10:00	73.65
	7/20/13 11:00	74.38
	7/20/13 12:00	73.17
	7/20/13 13:00	73.95
	7/20/13 14:00	74.77
	7/20/13 15:00	75.55
	7/20/13 16:00	75.77
	7/20/13 17:00	75.12
	7/20/13 18:00	74.38
	7/20/13 19:00	74.16
	7/20/13 20:00	74.03
	7/20/13 21:00	73.39
	7/20/13 22:00	73.95
	7/21/13 0:00	74.12
	7/21/13 1:00	74.12
	7/21/13 2:00	73.56
	7/21/13 3:00	73.08
	7/21/13 4:00	72.91
	7/21/13 5:00	72.87
	7/21/13 6:00	72.57
	7/21/13 7:00	72.65
	7/21/13 8:00	72.44
	7/21/13 9:00	73.52
	7/21/13 10:00	73.86
	7/21/13 11:00	74.55
	7/21/13 12:00	74.90



#	Date Time (PST)	Temp (°F)	Plot Title: 1000444-ladder exit

	7/21/13 13:00	74.03
	7/21/13 14:00	74.03
	7/21/13 15:00	74.12
	7/21/13 16:00	73.90
	7/21/13 17:00	75.77
	7/21/13 18:00	75.03
	7/21/13 19:00	74.86
	7/21/13 20:00	74.42
	7/21/13 21:00	73.99
	7/21/13 22:00	74.30
	7/21/13 23:00	73.90
	7/22/13 0:00	73.86
	7/22/13 1:00	73.52
	7/22/13 2:00	73.21
	7/22/13 3:00	73.21
	7/22/13 4:00	73.26
	7/22/13 5:00	73.26
	7/22/2013 6:00	73.69
	7/22/2013 7:00	73.86
	7/22/2013 7:40	
	7/22/2013 7:49	
	7/22/2013 8:00	74.03
	7/22/2013 9:00	74.03
	7/22/2013 9:50	
	7/22/2013 9:52	
	7/22/2013 10:00	75.03
	7/22/2013 10:21	
	7/22/2013 11:00	75.07
	7/22/2013 12:00	75.42
	7/22/2013 13:00	75.07
	7/22/2013 14:00	74.81
	7/22/2013 15:00	74.51
	7/22/2013 16:00	75.16
	7/22/2013 17:00	75.20
	7/22/2013 18:00	74.12
	7/22/2013 19:00	73.34
	7/22/2013 20:00	73.08
	7/22/2013 21:00	72.31
	7/22/2013 22:00	72.26
	7/22/2013 23:00	72.91
	7/23/2013 0:00	72.39
	7/23/2013 1:00	71.83
	7/23/2013 2:00	72.18
	7/23/2013 3:00	72.48
	7/23/2013 4:00	72.48
	7/23/2013 5:00	72.57
	7/23/2013 6:00	72.83
	7/23/2013 7:00	72.96
	7/23/2013 8:00	73.13
	7/23/2013 9:00	73.30

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 22, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.50	11.80	13.40	735.42	633.09	102.33				735.46
2		1	27.20	11.80	13.50	735.45	633.29	102.16				735.46
3		1	25.60	11.80	13.50	735.46	633.07	102.39				735.46
4		2	25.70	11.90	13.50	735.47	633.03	102.44				735.46
5		1	25.70	11.90	13.50	735.48	633.09	102.39				735.46
6		1	25.80	12.00	13.60	735.54	633.05	102.49				735.46
7		1	25.80	11.90	13.60	735.58	632.97	102.61				735.46
8		1	30.70	12.00	18.30	735.50	633.50	102.00				735.46
9		1	30.70	12.00	18.50	735.51	633.36	102.15				735.46
10		1	30.60	11.90	18.50	735.48	633.44	102.04				735.46
11		1	30.80	12.00	18.50	735.43	633.50	101.93				735.46
12		1	30.80	12.00	18.50	735.43	633.47	101.96				735.52
13		1	28.70	11.90	16.50	735.42	633.25	102.17				735.52
14		1	28.60	11.80	16.50	735.36	633.26	102.10				735.52
15		2	28.50	11.80	16.50	735.36	633.22	102.14				735.52
16		2	28.60	11.80	16.50	735.39	633.29	102.10				735.52
17		2	25.80	15.00	10.50	735.40	633.34	102.06				735.52
18		1	24.00	16.80	6.90	735.40	633.32	102.08				735.51
19		1	24.00	16.90	6.90	735.45	633.38	102.07				735.51
20		1	24.10	16.90	6.90	735.47	633.25	102.22				735.51
21		1	24.10	16.90	6.90	735.52	633.27	102.25				735.51
22		1	25.80	16.90	6.90	735.55	633.48	102.07				735.51
23		1	24.00	16.90	6.90	735.59	633.26	102.33				735.51
24		1	24.00	16.90	6.90	735.60	633.21	102.39				735.51
TOT		35										
AVG		1	26.88	13.48	12.99	735.47	633.27	102.20				735.49
MAX			30.80	16.90	18.50	735.60	633.50	102.61				735.52
MIN			24.00	11.80	6.90	735.36	632.97	101.93				735.46

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM Tuesday July 23, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.70	16.80	6.90	735.63	633.56	102.07				735.51
2		1	24.00	16.80	6.90	735.65	633.20	102.45				735.51
3		1	24.20	16.90	7.10	735.66	633.27	102.39				735.51
4		1	27.30	16.90	10.10	735.67	633.24	102.43				735.51
5		1	27.50	17.00	10.20	735.71	632.92	102.79				735.51
6		1	27.50	16.90	10.30	735.72	633.16	102.56				735.51
7		1	27.40	16.90	10.30	735.75	633.11	102.64				735.51
8		1	27.90	17.30	10.40	735.72	633.00	102.72				735.51
9		2	27.30	11.90	15.10	735.77	633.09	102.68				735.74
10		1	27.20	11.80	15.10	735.78	633.07	102.71				735.74
11		1	27.20	11.80	15.10	735.76	633.10	102.66				735.74
12		1	27.00	11.60	15.10	735.77	633.12	102.65				735.74
13		1	27.20	11.70	15.20	735.72	633.08	102.64				735.74
14		2	26.90	11.60	15.10	735.75	633.10	102.65				735.74
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
TOT		20										
AVG		1	26.74	14.71	11.64	735.72	633.14	102.57				735.61
MAX			27.90	17.30	15.20	735.78	633.56	102.79				735.74
MIN			24.00	11.60	6.90	735.63	632.92	102.07				735.51

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

Tuesday, July 23, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference calls were chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, Montana, Idaho, BOR, NOAA, CRITFC/Umatilla, Oregon, Washington, Salish-Kootenai Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of Lower Granite Special Operation for Adult Fish Passage

There were two conference calls today, one at 11:00 am and another at 3:30 pm to follow up on the morning's discussion.

Baus opened the morning call by reporting that the temperature data the COE hoped to provide today were not available due to downloading difficulties at the project. He also reported that the fixed-blade unit at Lower Granite was repaired last year so that it operates within the 1% range. Lisa Wright, COE, noted the tables in the FPP need updating to reflect the current 1% operating range for Unit 1. Wright introduced the attachments to today's agenda, which include temperature data at the adult trap through July 15; temperature data at the adult ladder exit through July 23; adult passage data for Chinook, steelhead and sockeye from June 1 through July 23; and SOR 2013-4 containing five bullet points that describe the Salmon Managers' recommendations for addressing temperature issues in the adult ladder at Lower Granite.

Discussion moved to whether enough data were available for informed discussion of these five options. Baus reported that the special operation coordinated at TMT and implemented last night ended this morning at 8 am when the project returned to normal unit priority operations per the FPP. Margaret Filardo, FPC, said the only additional information that will be available later today is the hourly ladder temperature readings, which have been difficult to download. Greg Moody, COE, offered to send TMT members his hourly adult fish passage data for 5 am to 10 pm today.

David Wills, USFWS, said more information is needed before TMT can do its work today. Erick Van Dyke also wanted more information and said Oregon doesn't support modifications to the operation identified in the FOP. Tony Norris, BPA, said ladder temperature data are needed to determine whether the operation succeeded in reducing the ladder temperature before a decision is made to test the second operation proposed yesterday. That operation would probably increase tailwater temperatures at Lower Granite.

TMT members reconvened in the afternoon after FPAC met to review the available temperature and fish passage data. Paul Wagner, NOAA, reported that 6 sockeye passed Lower Granite yesterday which represents a slight increase over the total of 2 that passed on Sunday. However, 400 or more sockeye still appear to be delayed as a result of the temperature differential between the Lower Granite fish ladder and the tailrace.

SOR 2013-4 (attachment 1e) contains a bullet list of recommendations from the Salmon Managers for addressing temperature issues at Lower Granite. Wagner outlined the bullet items:

1. *Cycle the navigation locks as much as practical to facilitate the passage of adult sockeye and address thermal stratification in the forebay.* Elevated forebay temperatures are a concern. Because sockeye have been known to pass via navigation locks this measure may increase sockeye passage as well as attempt to reduce the magnitude of stratification in the forebay that would have a beneficial effect by reducing temperatures in the forebay.
2. *Reduce the combination of the warmest gravity flow water into the ladder and increase cool water from Diffuser #14.* Possible options here include modifying the gate, reducing the forebay elevation to MOP and increasing the water contribution from Diffuser #14.
3. *Use multiple pumps to pull cooler water from deeper in the forebay into the ladder.* This would require large pumps, and probably more than one of them, but the technology has good potential.
4. *Temporarily extend the diffuser in the deeper water to provide cooler water.* This would help address stratification issues in the reservoir below 20 feet of depth.
5. *Modify day/night operations.* From 0600 to 1800 hours, operate Unit 1 as first priority and spill through just the RSW during daylight hours while juveniles pass. From 1800 hours to 0600 hours, spill flows above what is needed for station service (5 kcfs) and maximize spill.

Wagner also emphasized that a long-term fix will be needed for Lower Granite temperature problems. Baus gave the Action Agencies' initial responses to the options presented in SOR 2013-4:

1. Generally speaking, the navigation locks are cycled 2-12 times a day. The COE is unable to commit to more lockages because this would likely create conflicts with the current lockage schedule. Furthermore, the navigation locks are operated for navigation and subsequently there would

likely be operational limitations regarding operation of navigation locks for fish passage.

2. Reducing the warmest gravity flows into the ladder would only be a long-term fix because it involves modifying the gate design. Meanwhile the COE is bound to the current variable MOP operation identified in the FOP for navigation safety. Bill Proctor, COE, said modifying the gate design is a good idea that should be pursued because it could reduce the volume of hot water entering the ladder. Tom Lorz, CRITFC, asked whether the bulkhead could be lowered, but Ann Setter, COE Walla Walla, said this isn't a viable option because Diffuser #14 is currently open about 40%, and opening it further would bring in flows well in excess of 68 degrees F.
3. Based on feedback from project staff, using the pumps to pull cooler water into the ladder can't be done in the near term with any measurable impact.
4. Temporarily extending the diffuser intake isn't a near-term option either.
5. Modifying operations to Unit 1 priority and going to station service out of Unit 5 while spilling to the gas cap is something the COE would consider.

Scott Bettin, BPA, asked the Salmon Managers what the criteria for success are at Lower Granite. Charles Morrill, Washington, said a change in ladder temperatures within 24-48 hours of implementing the special operation would be indicative of success.

Hearing no objections, the Action Agencies will implement the last component of the SOR as a test operation specifically, from 0600 to 1800 hours maximize powerhouse operations (unit 1 priority) while providing spill through the RSW and 2) from 1800 to 0600 hours operate to powerhouse station service and spill to the gas cap. Baus said spilling to the gas cap could exceed the 68 degree F criteria in the LWG tailrace..

TMT will reconvene tomorrow for its regular meeting, when this operation will be reviewed and discussed.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Paul Wagner	NOAA
Trevor Conder	NOAA
Lisa Wright	COE
Tom Lorz	CRITFC/Umatilla
Greg Moody	COE Walla Walla
Erick Van Dyke	Oregon
Margaret Filardo	FPC
Tony Norris	BPA

David Wills	USFWS
Scott Bettin	BPA
Ann Setter	COE Walla Walla
Charles Morrill	Washington
Dave Statler	Nez Perce
Bill Proctor	COE
Russ Kiefer	Idaho
Dan Fiel	COE

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 23, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert; Facilitation Support: Emily Plummer

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Lower Granite Adults Ladder Temperatures

A phone call was convened the morning of 7/23 to discuss the temperatures in the Lower Granite adult fish ladder, and concerns expressed by the salmon managers about the recent decline in passage of adult sockeye past the project. A short term operation had been coordinated by TMT the day before and was implemented by the Corps. Doug Baus, Corps, reported that Unit 1 priority plus RSW spill was implemented yesterday afternoon, and the Unit 1 operation is within 1% of peak efficiency. He shared available data but TMT agreed the most current information was still needed to inform today's discussions about next steps. They postponed the meeting until 3:30 pm in the afternoon.

At that time, Paul Wagner, NOAA, reported that adult sockeye passage had seen a slight increase to 6 fish on Monday 7/22, but the salmon managers did not believe this was enough to be successful since about 300 total have not yet passed the project. The salmon managers presented SOR 2013-4 which outlined a number of suggestions for structural modifications and an operational change to help moderate temperatures in the ladder and promote fish movement. All options were intended to support increased adult sockeye passage through Lower Granite dam.

The proposed operation was to modify operations at Lower Granite Dam to the following: 1) from 0600 to 1800 maximize powerhouse operations (Unit 1 priority) while providing spill through the RSW and 2) from 1800 to 0600 operate to powerhouse station service and maximize spill. The Corps clarified that powerhouse station service is one unit operating at speed-no-load (5 kcfs), and that spill would be up to but not to exceed the TDG cap, currently at 25 kcfs.

Action: Walla Walla District Corps explored the proposed structural modification suggestions and generally said they needed to look further into these options and get back to TMT the next day. On the operational proposal (described above), the action agencies agreed to implement this for a 24-hour cycle, starting this evening and through the following evening. TMT planned to revisit this issue during their regularly scheduled meeting tomorrow morning at 9:00 am. (See notes from 7/24 meeting for a continuation of this discussion.)

SYSTEM OPERATIONAL REQUEST: #2013-4

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: National Marine Fisheries Service, Idaho Department of Fish and Game, Columbia River Inter-Tribal Fish Commission, Nez Perce Tribe, Colville Tribe, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

TO:

**Colonel John S. Kem
Col. John Eisenhower
Lt. Col. Andrew Kelly
James D. Barton
Doug Baus
David Poganis
Karl Kanbergs
Col. Bruce A. Estok
Lorri Lee
Elliot Mainzer
Tony Norris
Scott Bettin
Steve Oliver
Lori Bodi**

**COE-NWD
COE-NWD
COE-Walla Walla
COE-Water Management
COE-RCC
COE-PDD
COE-NWD-NP-WM-RCC
COE-Seattle District
USBR-Boise Regional Director
BPA-Administrator
BPA-PGPO-5
BPA- KEWR-4
BPA-PG-5
BPA-KE-4**

FROM: Paul Wagner Chair FPAC

DATE: July 23, 2013

SUBJECT: Water Temperature Issues at the Lower Granite Dam Adult Ladder

OBJECTIVE: To increase adult passage and reduce the water temperature in the Lower Granite Dam Adult Ladder.

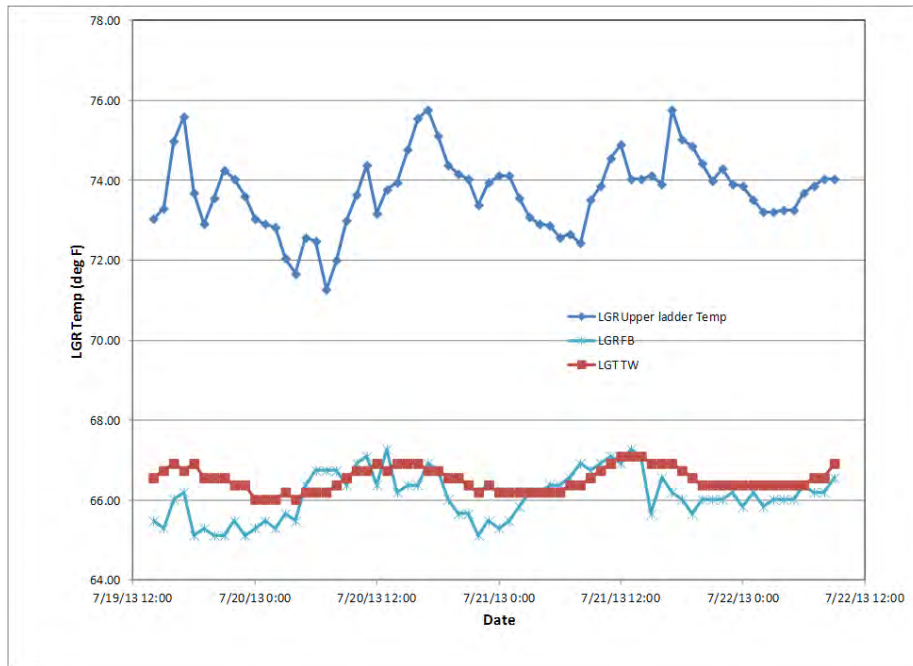
SPECIFICATIONS: Immediately take actions that may increase adult passage and decrease the water temperature in the adult ladder.

The Lower Granite forebay is currently operating at elevation 735.6 ft (7-22-13). The temperature of the ladder near the exit (20 feet from exit and 5 ft depth) has been ranging between 72 and 76° F. The upper ladder at LGR is comprised of two sources of water: 1) gravity flow directly from the forebay into the upper ladder. and, 2) auxiliary water coming from diffuser #14, which pulls water from the forebay at a depth of 18–20 feet. At a depth of 5 meters (16.4 feet), forebay water has been ranging between 68 and 72° F. Diffuser #14 has been contributing approximately 40% of the total ladder flow. The total contribution of gravity forebay water along with water from diffuser #14 contributes well over one-half of the entire ladder flow.

We are providing the following suggestions, but the COE should not be limited to these suggestions:

- Cycle navigation locks as much as practical to facilitate the passage of adult sockeye and potentially reduce thermal stratification in the forebay.
- Reduce the contribution of the warmest gravity flow water into the ladder and increase cool water from Diffuser #14. Possible alternatives to accomplish this objective include:
 - A modified gate could be installed at the exit that would limit the gravity flow water to the ladder. The gate could be designed to pull water from below the surface of the forebay, and the opening reduced to only supply a volume of water that would be necessary to supply the upper ladder above the contribution of Diffuser #14 water.
 - The forebay elevation could be reduced to MOP or elevation 733 feet. This would reduce the depth of gravity water at the exit by 2.6 feet.
 - In either case, to make up the loss in gravity water, the contribution of Diffuser #14 water would be increased (several degrees cooler than the gravity water).
- Utilize multiple pumps to pull cooler water from deeper into the forebay and add into the ladder. Specifically, this could aid cooling to facilitate fish passage from the diffuser to the exit.
- Temporarily extend the diffuser intake into deeper water to provide cooler water.
- Modify operations at Lower Granite Dam to the following: 1) from 0600 to 1800 maximize powerhouse operations (Unit 1 priority) while providing spill through the RSW and 2) from 1800 to 0600 operate to powerhouse station service and maximize spill.

JUSTIFICATION: Present temperatures in the ladder, as well as the discrepancy in the temperature between the ladder and the tailrace, are impeding adult passage at the facility. Fish count data over the past several days (http://www.fpc.org/currentdaily/HistFishTwo_7day-ytd_Adults.htm) have shown declines for all species.

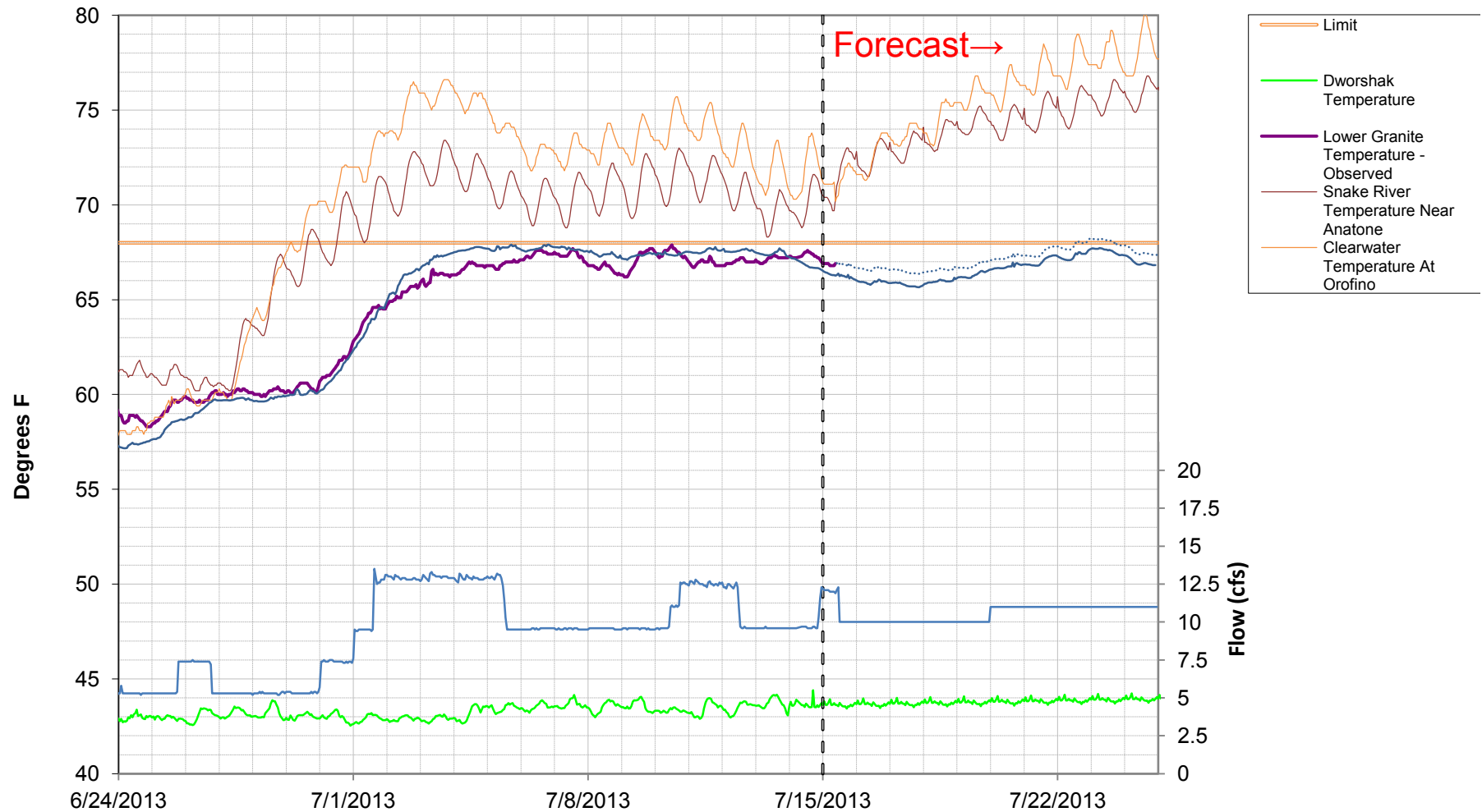


Daily temperatures in the upper portion of the ladder have, at times, been close to 76°F.

Elevated temperatures in the Lower Granite Adult ladder is not a new issue and it is apparent that long term modifications are necessary to avoid these high ladder temperatures in the future.

Output from CEQUALUtility Pre-processor
Analog Year 2009

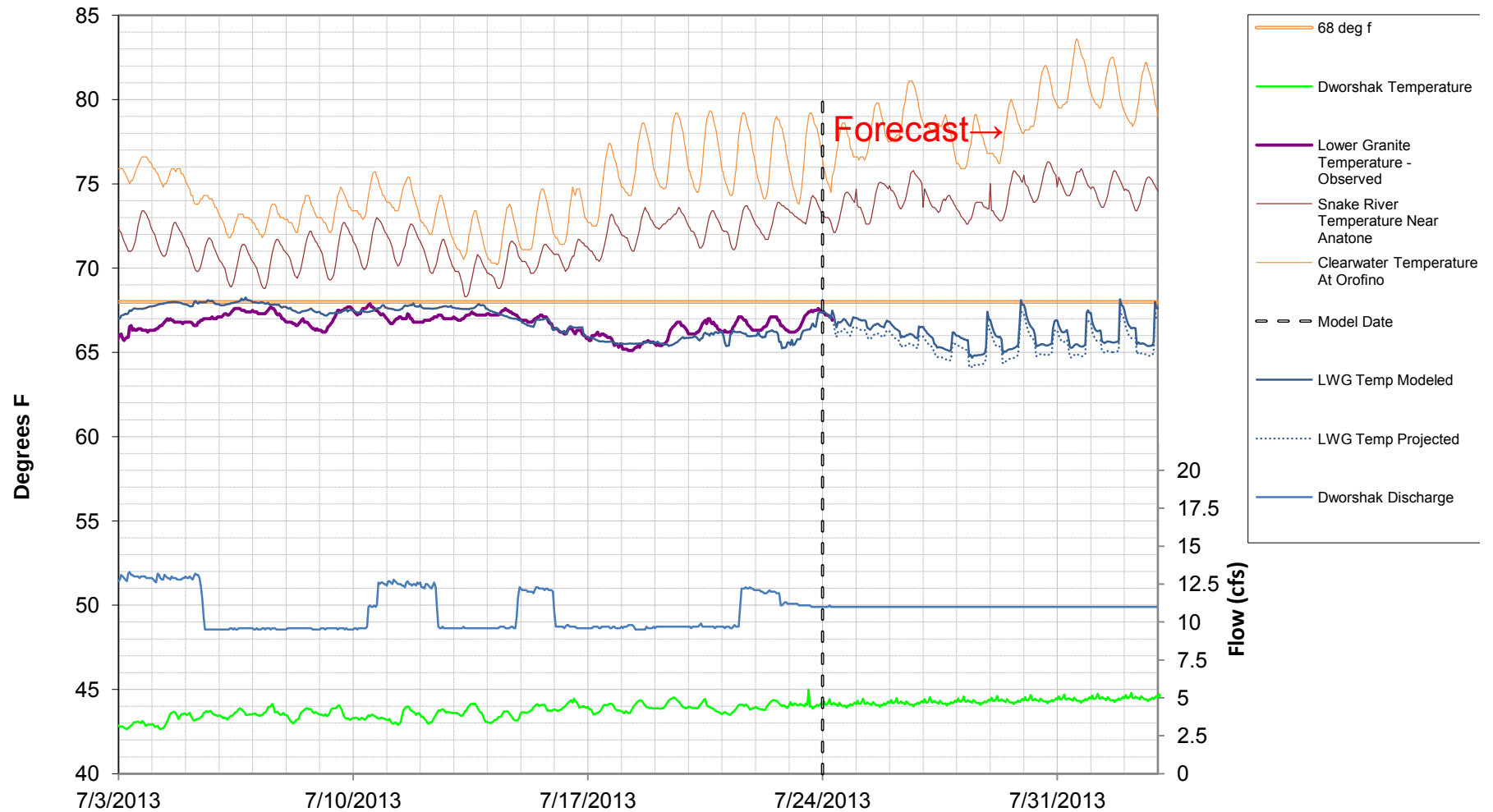
Water Temperature Comparisons Model from 6/24/2013 to 7/25/2013 Observed Data to 7/15/2013



Analog Year 2010

DWR@11kcfs, LWG Gen @ 5kcfs 2000-0800, 12.5kcfs daytime

Water Temperature Comparisons Model from 7/3/2013 to 8/3/2013 Observed Data to 7/24/2013



TECHNICAL MANAGEMENT TEAM

NOAA: Paul Wagner / Richard Domingue

OR: Erick Van Dyke

WA: Charles Morrill

Kootenai: Sue Ireland / Billy Barquin

Colville: Sheri Sears / Keith Wolf

Umatilla: Tom Lorz (CRITFC)

BOR: John Roache / Mary Mellema / Pat McGrane

COE: Doug Baus / Karl Kanbergs

USFWS: David Wills / Steve Haeseker

ID: Russ Kiefer / Pete Hassemer

MT: Jim Litchfield / Brian Marotz

Spokane: Andy Miller

Nez Perce: Dave Statler

BPA: Tony Norris / Scott Bettin / Robyn MacKay

TMT MEETING

Wednesday July 24, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room

Portland, Oregon 97209-4142

Map Quest [\[Directions\]](#)

TMT MEETING

Phone Number (877) 336-1274

Access Code 3871669

Security Code 0374

We have had disruptions on the phone because people are not hitting 'mute' after dial in.

Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.

Please e-mail her at rgumpert@cnnv.net or call her at (503) 248-4703.

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes - [July 10](#)
3. Updated SOR Distribution Lists - [July 24 List \(link to TMT SOR page\)](#)
4. Lower Granite Adult Ladder Temperatures - Doug Baus, COE RCC
 - a. [SOR 2013-4](#)
 - b. [Hourly Project Data, July 23-25](#)
 - c. [Adult Passage Data \(Fish Passage Center Website\)](#)
 - d. [Hourly Adult Passage Data, July 23-24](#)

- e. [Hourly Ladder Temperature Data \(July 24 update\)](#)
- 5. Dworshak Temperature Control Operation - *Steve Hall, COE-NWW*
 - a. [July 15 Temperature Model](#)
 - b. [July 24 Temperature Model](#)
 - c. [Current Water Temperature Report](#)
- 6. Treaty Fishing - *Kyle Dittmer, CRITFC*
 - a. [SOR2013-C4](#)
 - b. [SOR2013-C5](#)
- 7. Operations Review
 - a. Reservoirs - [LGS Flat Spill Notification](#)
 - b. Fish
 - c. Water Quality - [June 2013 TDG Exceedances](#)
 - d. Power System
- 8. Other
 - a. Set agenda and date for next meeting - **July 31, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

Wright, Lisa NWD

From: Baus, Douglas M NWD
Sent: Thursday, July 18, 2013 2:51 PM
To: Barry Espenson (E-mail); Baus, Douglas M NWD; Benny Leung; Bill Crampton; Bill Tweit; Billy Barquin (wbarquin@kootenai.org); Blake Shaffer; Bob Rose; Bowers, Gregory H NWD; BPA Rick Pendergrass; BPA Norris, Tony; BPA Robyn MacKay; BPA Scott Bettin; Brad Houslet (Brad.houslet@wstribes.org); Bradshaw, Mike; Bruce MacKay; Bruce Suzumototo; Buchholz, Robert J NWP; Buchko, Michael; Burrell, Steven NWD; Casey Baldwin (casey.baldwin@colvilletribes.com); 'Charles Morrill'; Chris McDowall; Christopher Jylkka; Dan Spear (djspear@bpa.gov); Dave Johnson; Dennis Rohr; Derek Hoffman; Domingue, Rich; English, Scott E NWD; Erick VanDyke; Faulkner, Donald L NWD; Feil, Dan H NWD; Fenolio, Joel M NWS; Glassley, Ann K NWW; Glenn Traeger; Greg Lawson; Guy Moura; Haeseker, Steve; Hall, Stephen C NWW; Hamilton, Laura J NWD; Hoffman, Gregory C NWS; howard_schaller@fws.gov; J Maroney; Jason Flory; Jeffrey Richter; John Oh (joh@energygps.com); Jonathan Hart; Kanbergs, Karlis NWD; Kathy Ceballos; Keith Wolf; Kiefer, Russ; Klatte, Bernard A NWP; Kruger, Rick; Kyle Dittmer (DITK@critfc.org); Linehan Outfitting Company; Litchfield, Jim; Lut, Agnes (BPA) - KEWR-4; Mackey, Tammy M NWP; Margaret Filardo; Mark Kruzel; Marotz, Brian; Moody, Gregory P NWW; Pat Vivian (pvivian3@comcast.net); Paul Wagner; Pavlik-Kunkel, Deanne; 'Pete Hassemer'; Peter Richardson; Peters, Rock D NWD; Proctor, William D NWD; Reese, Amy R NWS; Richelle Beck (rmbeckdirect@yahoo.com); rickys@spokanetribe.com; Robin Gumpert (rgumpert@cnw.net); Rod Sando; Russ George; Russell Langshaw (rlangsh@gcpud.org); Ruth Burris; Schwartz, Dennis E NWP; Schwarz, Tracy S NWW; Sears, Sheri; Setter, Ann L NWW; Shane Scott; Statler, Dave; Stu Levit; Sue Ireland; Thomas Paska; Tom Lorz (lorz@critfc.org); travis.togo@gmail.com; USBR Mellema, Mary; USBR Roache, John; Wertheimer, Robert H NWP; Wills, Dave; Wright, Lisa NWD
Subject: Official TMT Coordination: Little Goose Dam Spill Change from 30% to 7-11 kcfs (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

TMT Members, Alternates, and Interested Parties,

Little Goose Dam (LGS) will be transitioning from 30% spill to a constant spill rate of 7-11 kcfs this afternoon. This spill change as well as the justification is described in the 2013 Fish Operations Plan (FOP) which states the following on page 6.

"... At Little Goose Dam, when daily average flow in the lower Snake River is ≤ 32 kcfs, achieving 30% spill would require switching powerhouse operations between operating two units at the low end of the $\pm 1\%$ of best efficiency range to operating one unit at the high end of the $\pm 1\%$ of best efficiency range. This operation, in combination with constant inflow from Lower Granite Dam, often makes it difficult to achieve the FOP prescribed spill level downstream at Lower Monumental Dam and to also maintain MOP operations. In years past, through coordination with TMT during low flow periods, Little Goose spill operations changed from 30% to a constant spill level of approximately 7-11 kcfs to smooth out Little Goose outflow, meet Lower Monumental FOP specified spill levels, and maintain the MOP elevation at Little Goose. A similar operation will be implemented in 2013, if necessary, depending on river flow."

The criteria required to switch from 30% to the constant spill rate has been achieved at LGS since July 16 as day average outflows have been ≤ 32 kcfs. Current hourly data as well as recent daily data on LGS outflows may be found on the following website:

http://www.nwd-wc.usace.army.mil/ftppub/project_data/hourly/lgs_0daysback.txt

Furthermore, according to the NWRFC day average flows are forecasted to be ≤ 32 kcfs over the next 10 day period and may be found on the following website:

<http://www.nwd-wc.usace.army.mil/report/projdata.htm#L>

This operation was discussed during the July 10th TMT meeting and the Corps will provide an update on this operation at the next TMT meeting scheduled for July 24.

Regards,

Doug

Doug Baus
US Army Corps of Engineers
Northwestern Division
Phone: (503) 808-3995
Douglas.M.Baus@usace.army.mil

Classification: UNCLASSIFIED
Caveats: NONE

Daily Report LGR T

7/23/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	skad	lamprey	all pk	all ke
1	8	0	6	0	0	0	0	0	0	0	0	0			1	0	1	0
2	20	-17	12	-9	1	-1	1	0	0	0	0	0			0	0	0	0
3	29	-24	33	-14	7	-1	3	-1	1	0	0	0			1	0	0	0
4	17	-20	23	-28	2	-1	1	0	0	0	0	0			1	-1	0	0
5	4	-5	1	-7	1	-3	1	-1	0	0	0	0			3	0	0	0
6	7	-14	2	0	2	0	1	-1	0	0	0	0			3	0	0	0
7	2	-5	0	0	0	-1	0	0	0	-1	0	0			2	0	0	0
8	5	-5	0	-2	6	-2	2	0	0	0	1	0			6	0	0	0
Su	2		17		10		6		0		1				16		1	
Total	2		20		12		7		0		1				19		1	
* 1.2:																		

Unit 1 priority after hour 2 + spill patter LWG-12
0600 - 1800 hrs

Daily Report LGR T

7/24/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	shad		lamprey		all pk	all ke
1	2	-2	1	-2	0	0	0	0	0	0	0	0			0	0	1	0		
2	1	0	1	0	1	0	3	0	0	0	0	0			0	0	0	0		
3	2	0	2	-1	2	0	2	-1	0	0	0	0			0	0	0	0		
4	6	-6	5	-4	2	0	0	-2	0	0	0	0			3	0	0	0		
5	7	-10	9	-4	2	-4	2	-2	0	-1	0	0			1	0	0	0		
6	2	-1	2	-2	2	-1	0	0	0	0	0	0			5	0	0	0		
7	19	-10	8	-8	0	0	2	0	0	0	0	0			18	0	0	0		
8	3	-5	0	0	1	-2	1	0	0	0	0	0			7	0	0	0		
Su	8		7		3		5		-1		0				34		1			
Total	10		8		4		6		-1		0				41		1			
* 1.2:																				

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1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 22, 2013					
	GROSS	STA	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG	SUPR	UNIT	STATUS		
	GEN	USE	--	IN KCFS	--	IN FEET + MSL		HEAD	CAP	ON	ON	LWSI	
	MW	MW	TOTAL	POWER	SPILL	FOREBAY	TAILWATR	FT	MW	RMT	LINE	AVL	GAGE
													ELEV
1		1	25.50	11.80	13.40	735.42	633.09	102.33					735.46
2		1	27.20	11.80	13.50	735.45	633.29	102.16					735.46
3		1	25.60	11.80	13.50	735.46	633.07	102.39					735.46
4		2	25.70	11.90	13.50	735.47	633.03	102.44					735.46
5		1	25.70	11.90	13.50	735.48	633.09	102.39					735.46
6		1	25.80	12.00	13.60	735.54	633.05	102.49					735.46
7		1	25.80	11.90	13.60	735.58	632.97	102.61					735.46
8		1	30.70	12.00	18.30	735.50	633.50	102.00					735.46
9		1	30.70	12.00	18.50	735.51	633.36	102.15					735.46
10		1	30.60	11.90	18.50	735.48	633.44	102.04					735.46
11		1	30.80	12.00	18.50	735.43	633.50	101.93					735.46
12		1	30.80	12.00	18.50	735.43	633.47	101.96					735.52
13		1	28.70	11.90	16.50	735.42	633.25	102.17					735.52
14		1	28.60	11.80	16.50	735.36	633.26	102.10					735.52
15		2	28.50	11.80	16.50	735.36	633.22	102.14					735.52
16		2	28.60	11.80	16.50	735.39	633.29	102.10					735.52
17		2	25.80	15.00	10.50	735.40	633.34	102.06					735.52
18		1	24.00	16.80	6.90	735.40	633.32	102.08					735.51
19		1	24.00	16.90	6.90	735.45	633.38	102.07					735.51
20		1	24.10	16.90	6.90	735.47	633.25	102.22					735.51
21		1	24.10	16.90	6.90	735.52	633.27	102.25					735.51
22		1	25.80	16.90	6.90	735.55	633.48	102.07					735.51
23		1	24.00	16.90	6.90	735.59	633.26	102.33					735.51
24		1	24.00	16.90	6.90	735.60	633.21	102.39					735.51
TOT		35											
AVG		1	26.88	13.48	12.99	735.47	633.27	102.20					735.49
MAX			30.80	16.90	18.50	735.60	633.50	102.61					735.52
MIN			24.00	11.80	6.90	735.36	632.97	101.93					735.46

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM	Tuesday July 23, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.70	16.80	6.90	735.63	633.56	102.07				735.51
2		1	24.00	16.80	6.90	735.65	633.20	102.45				735.51
3		1	24.20	16.90	7.10	735.66	633.27	102.39				735.51
4		1	27.30	16.90	10.10	735.67	633.24	102.43				735.51
5		1	27.50	17.00	10.20	735.71	632.92	102.79				735.51
6		1	27.50	16.90	10.30	735.72	633.16	102.56				735.51
7		1	27.40	16.90	10.30	735.75	633.11	102.64				735.51
8		1	27.90	17.30	10.40	735.72	633.00	102.72				735.51
9		2	27.30	11.90	15.10	735.77	633.09	102.68				735.74
10		1	27.20	11.80	15.10	735.78	633.07	102.71				735.74
11		1	27.20	11.80	15.10	735.76	633.10	102.66				735.74
12		1	27.00	11.60	15.10	735.77	633.12	102.65				735.74
13		1	27.20	11.70	15.20	735.72	633.08	102.64				735.74
14		2	26.90	11.60	15.10	735.75	633.10	102.65				735.74
15		2	27.10	11.70	15.00	735.71	633.15	102.56				735.74
16		2	28.70	11.60	15.10	735.70	633.26	102.44				735.74
17		2	27.20	11.70	15.10	735.72	633.07	102.65				735.74
18		1	27.10	11.70	15.20	735.74	633.10	102.64				735.74
19		1	26.70	11.20	15.20	735.71	633.12	102.59				735.74
20		1	30.30	5.00	25.00	735.65	633.13	102.52				735.74
21		1	30.60	5.00	25.30	735.62	633.12	102.50				735.74
22		1	30.40	5.00	25.10	735.57	633.11	102.46				735.74
23		1	30.30	5.00	25.00	735.54	633.23	102.31				735.74
24		1	28.20	5.00	22.90	735.54	633.30	102.24				735.74
TOT		35										
AVG		1	27.54	12.03	15.07	735.69	633.15	102.54				735.66
MAX			30.60	17.30	25.30	735.78	633.56	102.79				735.74
MIN			24.00	5.00	6.90	735.54	632.92	102.07				735.51

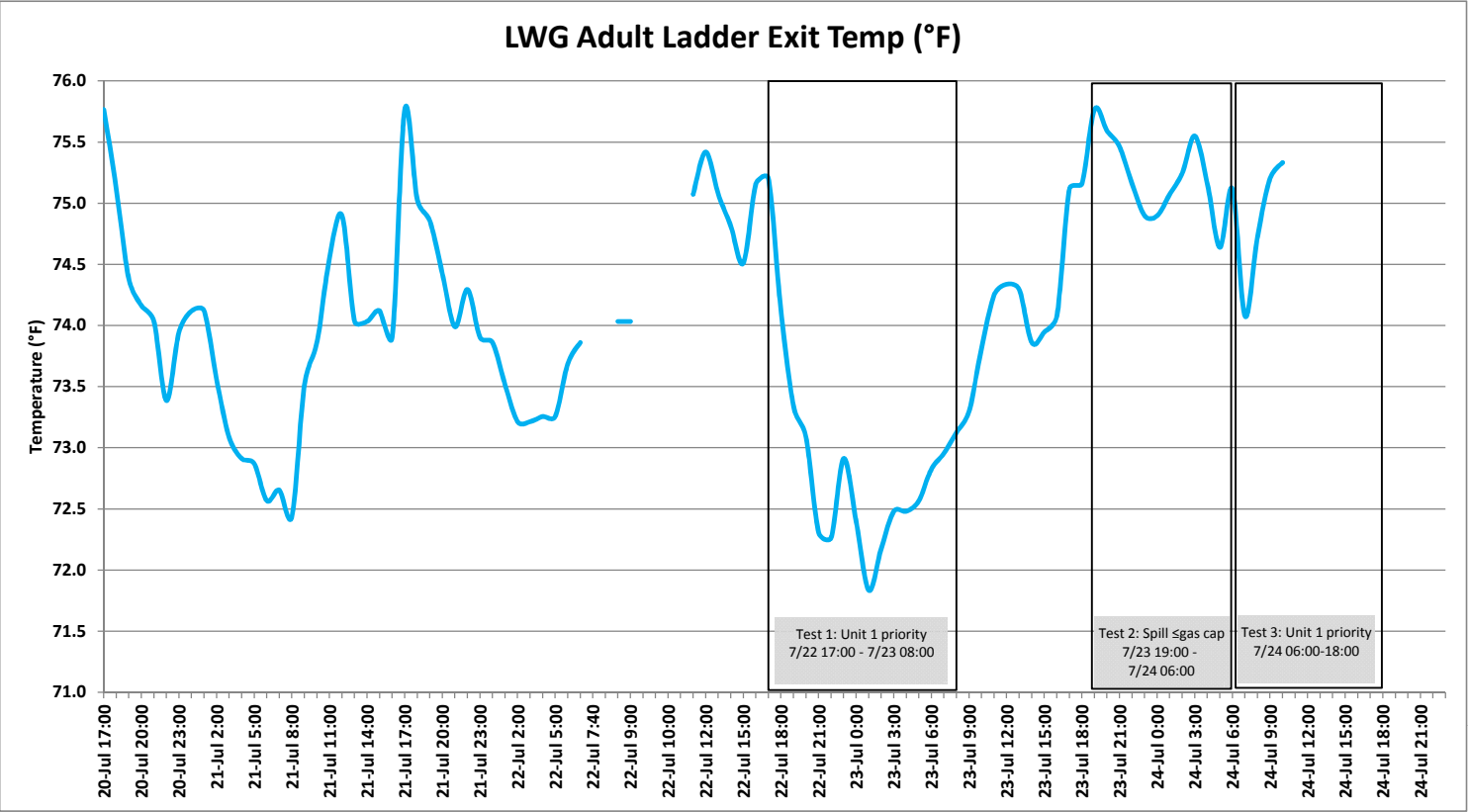
1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Wednesday July 24, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	28.20	5.00	22.90	735.52	633.33	102.19				735.74
2		1	28.00	5.00	22.70	735.52	633.35	102.17				735.74
3		1	27.90	5.00	22.60	735.53	633.37	102.16				735.74
4		1	28.00	5.00	22.70	735.52	633.43	102.09				735.74
5		1	28.10	5.00	22.80	735.52	633.37	102.15				735.74
6		1	29.60	7.00	22.30	735.51	633.43	102.08				735.74
7		1	26.90	16.90	9.60	735.56	633.52	102.04				735.74
8		1	27.20	17.00	10.00	735.54	633.43	102.11				735.74
9		1	27.40	17.10	10.00	735.56	633.61	101.95				735.74
10		1	27.40	17.10	10.00	735.58	633.48	102.10				735.74
11		1	27.40	17.10	10.00	735.56	633.24	102.32				735.74
12		1	27.30	17.10	9.90	735.56	633.38	102.18				735.74
13		1	29.00	17.10	9.90	735.58	633.36	102.22				735.74
14		1	27.10	17.00	9.80	735.54	633.09	102.45				735.74
15		2	27.20	17.10	9.90	735.54	633.21	102.33				735.74
16		1	27.30	17.00	10.00	735.57	633.20	102.37				735.74
17		1	27.30	17.00	10.00	735.59	633.25	102.34				735.74
18		1	26.90	16.40	10.20	735.58	633.17	102.41				735.74
19		1	28.70	5.00	23.40	735.56	633.19	102.37				735.74
20		1	28.70	5.00	23.40	735.54	633.22	102.32				735.74
21		1	28.70	5.00	23.40	735.52	633.29	102.23				735.74
22		2	28.70	5.00	23.40	735.50	633.26	102.24				735.74
23		1	28.70	5.00	23.40	735.47	633.32	102.15				735.74
24		1	28.70	5.00	23.40	735.48	633.39	102.09				735.74
TOT		35										
AVG		1	27.93	11.08	16.49	735.54	633.33	102.21				735.74
MAX			29.60	17.10	23.40	735.59	633.61	102.45				735.74
MIN			26.90	5.00	9.60	735.47	633.09	101.95				735.74

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Thursday July 25, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	LWSI GAGE ELEV
1		1	28.60	5.00	23.30	735.46	633.32	102.14				735.74
2		1	28.50	5.00	23.20	735.44	633.37	102.07				735.74
3		1	28.50	5.00	23.20	735.43	633.31	102.12				735.74
4		1	28.50	5.00	23.20	735.42	633.38	102.04				735.74
5		1	26.40	5.00	21.10	735.41	633.31	102.10				735.74
6		1	26.60	5.00	21.30	735.37	633.40	101.97				735.74
7		1	27.50	16.60	10.60	735.39	633.50	101.89				735.74
8		2	27.60	17.10	10.20	735.38	633.48	101.90				735.74
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
TOT		12										
AVG		1	27.77	7.96	19.51	735.41	633.38	102.03				735.74
MAX			28.60	17.10	23.30	735.46	633.50	102.14				735.74
MIN			26.40	5.00	10.20	735.37	633.31	101.89				735.74

Date Time (PST) Temp (°F)

Plot Title: 1000444-ladder exit

20-Jul 17:00	75.77
20-Jul 18:00	75.12
20-Jul 19:00	74.38
20-Jul 20:00	74.16
20-Jul 21:00	74.03
20-Jul 22:00	73.39
20-Jul 23:00	73.95
21-Jul 0:00	74.12
21-Jul 1:00	74.12
21-Jul 2:00	73.56
21-Jul 3:00	73.08
21-Jul 4:00	72.91
21-Jul 5:00	72.87
21-Jul 6:00	72.57
21-Jul 7:00	72.65
21-Jul 8:00	72.44
21-Jul 9:00	73.52
21-Jul 10:00	73.86
21-Jul 11:00	74.55
21-Jul 12:00	74.90
21-Jul 13:00	74.03
21-Jul 14:00	74.03
21-Jul 15:00	74.12
21-Jul 16:00	73.90
21-Jul 17:00	75.77
21-Jul 18:00	75.03
21-Jul 19:00	74.86
21-Jul 20:00	74.42
21-Jul 21:00	73.99
21-Jul 22:00	74.30
21-Jul 23:00	73.90
22-Jul 0:00	73.86
22-Jul 1:00	73.52
22-Jul 2:00	73.21
22-Jul 3:00	73.21
22-Jul 4:00	73.26
22-Jul 5:00	73.26
22-Jul 6:00	73.69
22-Jul 7:00	73.86
22-Jul 7:40	
22-Jul 7:49	
22-Jul 8:00	74.03
22-Jul 9:00	74.03
22-Jul 9:52	
22-Jul 10:00	75.03
22-Jul 10:21	
22-Jul 11:00	75.07
22-Jul 12:00	75.42
22-Jul 13:00	75.07
22-Jul 14:00	74.81
22-Jul 15:00	74.51
22-Jul 16:00	75.16
22-Jul 17:00	75.20
22-Jul 18:00	74.12



Date Time (PST) Temp (°F) Plot Title: 1000444-ladder exit

22-Jul 19:00	73.34
22-Jul 20:00	73.08
22-Jul 21:00	72.31
22-Jul 22:00	72.26
22-Jul 23:00	72.91
23-Jul 0:00	72.39
23-Jul 1:00	71.83
23-Jul 2:00	72.18
23-Jul 3:00	72.48
23-Jul 4:00	72.48
23-Jul 5:00	72.57
23-Jul 6:00	72.83
23-Jul 7:00	72.96
23-Jul 8:00	73.13
23-Jul 9:00	73.30
23-Jul 10:00	73.82
23-Jul 11:00	74.25
23-Jul 12:00	74.34
23-Jul 13:00	74.30
23-Jul 14:00	73.86
23-Jul 15:00	73.95
23-Jul 16:00	74.08
23-Jul 17:00	75.12
23-Jul 18:00	75.16
23-Jul 19:00	75.77
23-Jul 20:00	75.59
23-Jul 21:00	75.46
23-Jul 22:00	75.16
23-Jul 23:00	74.90
24-Jul 0:00	74.90
24-Jul 1:00	75.07
24-Jul 2:00	75.25
24-Jul 3:00	75.55
24-Jul 4:00	75.16
24-Jul 5:00	74.64
24-Jul 6:00	75.12
24-Jul 7:00	74.08
24-Jul 8:00	74.73
24-Jul 9:00	75.20
24-Jul 10:00	75.33
24-Jul 11:00	
24-Jul 12:00	
24-Jul 13:00	
24-Jul 14:00	
24-Jul 15:00	
24-Jul 16:00	
24-Jul 17:00	
24-Jul 18:00	
24-Jul 19:00	
24-Jul 20:00	
24-Jul 21:00	
24-Jul 22:00	
24-Jul 23:00	
25-Jul 0:00	

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 24, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert; Facilitation Support: Emily Plummer

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Meeting Minutes/Notes Review

TMT reviewed the 7/10 Official Minutes and Facilitator's Notes. The notes were approved with no further edits.

SOR Distribution List

COE informed the group that the SOR distribution list has been updated to reflect changes in command and other contact updates; the list is posted on the TMT SOR website. In order to ensure that requests are directed to the correct chain of command, please address the SOR to the appropriate list.

Action: Lisa Wright will add Mary Mellema, Reclamation, and Agnus Lut, BPA, to the SOR list.

Lower Granite Adult Ladder Temps

Doug Baus, Corps, provided an update on the Lower Granite Adult Ladder Temperature operation initiated on July 23 at 19:00, as requested in SOR #2013-4. The operation is as follows:

- Modify operations at Lower Granite Dam to the following: 1) from 0600 to 1800 maximize powerhouse operations (Unit 1 priority) while providing spill through the RSW and 2) from 1800 to 0600 operate to powerhouse station service and maximize spill.

There was clarification that the operation spilled to the gas cap, currently at 25kcfs. It is expected that the gas cap will be raised to 26kcfs today.

Ann Setter, Walla Walla District COE, provided a review on the feasibility of additional modifications suggested in SOR 2013-4. Ann and her team noted the following:

- In regards to cycling the navigation locks to facilitate passage and potentially reduce thermal stratification in the forebay: this option is not viable as it increases wear and tear on the locks that were not designed for that frequency of operation and it would move cool water into the tailrace.
- The request to modify the gate and use Diffuser #14 may be a longer term option, however, because there is no bulkhead it would take 2-3 days to engineer and test this modification and 3 or so days to construct; thus it is not a feasible short term modification.
 - It was noted that Corps is investigating whether cooler water could be provided by changing water pumping operations used for the NOAA study, hoping that this would decrease water temperatures in the ladder.
 - They are also exploring options to limit flow into the ladder via the exit (drawn from forebay surface water) in order to minimize gravity surface flow.
 - It was noted that it is not an option to limit the depth into the ladder in order to maximize depth in the exit.

- Reducing the forebay elevation to MOP will not impact temperatures, as there is no indication that there would be less reservoir surface elevation exposed to solar radiation in the top 10 meters of the pool.
(The FPC clarified that this suggestion was meant to reduce the volume of warm water in the forebay.)
- It is not feasible or effective to use pumps to pull cooler water from the forebay to be added to the ladder. The pumps available on site have a capacity of 200 gallons/minute, which would have an insignificant impact on the.
- It is also not a short term alternative to extend the diffuser intake into deeper water. This option is being explored for long-term implementation through coordination with FFDRWG.

There was inquiry as to if there are additional temperature probes (hobos) that can be installed to gather data. Ann informed that there are more probes available that could to be installed. TMT members suggested installing the probes near and upstream of Diffuser #14, in the forebay, adult ladder entrance and exit, and upstream of the count station. Ann also reported that data from the probe that is currently collecting data were still being downloaded after a technical difficulty and would be available by late morning/early afternoon.

The group briefly discussed how and if recommendations from the 2011 *Alternatives Analysis Report for Lower Granite Fishway Temperature Differential* report are being incorporated into Corps decisions regarding the recent adult passage issues. Corps staff said the report mainly details long term alternatives; however, it has informed their responses to the SOR suggestions as well as their own investigation to address the current situation. The group generally agreed that the information is useful to this discussion, but that FFDRWG is the appropriate forum to review in detail the 2011 report recommendations. A request has been submitted to add this discussion to the next Walla Walla FFDRWG meeting agenda (scheduled for tomorrow, 7/25).

In regards to the current operation being implemented, TMT clarified what success would look like – primarily, increased passage of adult sockeye through Lower Granite dam and moderated/lowered temperatures in the adult fish ladder, which would reduce the differential between the tailrace and ladder. They discussed that the available data were showing a slight increase in adult passage yesterday and that temperatures had moderated some – though temperatures in the forebay were expected to warm with the continuing hot weather trend over the next couple days. The operation of Unit 1 priority was scheduled to end on July 24th at 18:00 followed by a return to FOP operations of Unit 2 priority.

Russ Kiefer, Idaho Fish and Game, provided clarification from FPAC's perspective on their proposed operation and acknowledged that there is clearly no easy solution. The intention is to break up the temperature stratification in the forebay and provide the best attraction conditions for adults. This operation may increase temperatures in the tailrace and is challenging for juveniles; however, the criteria are aimed at passing adults. Since this operation may take several days to take effect, it was FPAC's preference that the Unit 1 priority operation continue through the weekend.

- Tony Norris, BPA, explained that it is not likely that this operation will have an impact on the forebay temperature stratification due to the consistent input of warm flows. Air temperature and weather have a more significant impact on water temperatures. The weather forecast calls for temperatures above 100°F for the next couple of days and then lower temperatures this weekend.

The group agreed that updated temperature and day time passage data are needed in order to continue evaluating success of the operation.

It was mentioned that water temperatures upstream of the project are also high and will likely stall fish that pass the project. There was inquiry as to if trapping and hauling is anticipated at this point. Russ Kiefer said that Idaho Fish and Game is prepared to transport, however, due to the risks of operating the ladder at temperatures above the criteria maximum of 72°F (as defined in the Fish Passage Plan), they would need this action to be requested by the region, particularly NOAA. If trapping and hauling is implemented the trap will be run to sample at 20%. IDFG will need 24 to 48 hours to implement this operation.

Dave Wills, USFWS, offered that TMT has an opportunity to encourage conversation around long term solutions at Lower Granite. It was suggested that all TMT members should talk with their FFDRWG representatives regarding the need for action. Additionally, TMT could consider issuing a statement requesting studies to address this issue and should increase awareness and the need for this via their SCT representatives.

FPAC expressed appreciation to the Corps for their ideas and input regarding modification options. Robin Gumpert, the Facilitator, commended everyone for bringing their expertise to the issue and for collaborating around finding a joint solution to the problem.

Action/Next Steps: Temperature and passage data will be posted to the 7/31/13 TMT Agenda as soon as they are available. The Corps agreed to run another 24-hour cycle of the current operation, now scheduled to sunset Thursday, July 25th at 18:00; Corps will then assume normal FOP operations. TMT will review the temperature and passage data and reassess the operation via conference call on Friday, July 26 at 1:00pm. Walla Walla District Corps will install additional thermal probes; additionally, if they are able to implement any of the operation modifications discussed they will. TMT will be updated on these operations. Walla Walla requested input from FPAC as to unit priority for the overnight operation, and NOAA said they will provide input by the end of the day.

Dworshak Temperature Control Operation

Jeremy Giovando, COE-NWW shared the District's temperature model run from 7/15 and reported that Dworshak is discharging 11 kcfs (full powerhouse plus 1.3 kcfs spill) and will continue to do so today to manage the continuing warm trend. The model is tracking well, however, last night's model did not track with actual temperatures; the inputs may have to be adjusted to account for changes resulting from Lower Granite operations.

Action: Walla Walla's temperature model run from today will be posted later today.

Treaty Fishing

Kyle Dittmer, CRITFC, shared two tribal requests for operations to support treaty fishing: SOR -C4 and SOR-C5; both of these are requests to hold the lower Columbia River pools (Bonneville, John Day, and The Dalles) to a hard constraint within a 1.5 foot band. SOR-C4 ran from July 15th to 18th and SOR-C5 will run from July 22nd to 25th.

There are currently 236 nets in the water: 95 in the Bonneville pool, 59 in The Dalles pool and 82 in the John Day pool. The summer commercial fishing season comes to an end next week, the next season will commence in August.

Doug Baus, Corps, said the Corps is implementing the operations as requested. Kyle said the tribal fishers appreciated the Corps and BPA successful efforts to keep the pools stable.

Operation Review

Reservoirs – Mary Mellema, Reclamation, reported on projects. Grande Coulee was at elevation 1288.8 feet. Hungry Horse was at elevation 3558.5 feet, with current 2.8 kcfs outflows expected to decrease to 2-2.5 in August and 1.9 in September. Lisa Wright, Corps, reported on projects. Libby was at elevation 2455.1 feet, with 14.2 kcfs inflows and 14 kcfs outflows. Albeni Falls was at elevation 2062.4 feet, with 16.6 kcfs inflows and 12.8 kcfs outflows. Dworshak was at elevation 1577.2 feet, with 1.1 kcfs inflows and 11.1 kcfs outflows. Lower Granite average inflows were 27.3 kcfs; McNary average inflows were 172.2 kcfs; and Bonneville average inflows were 172.1 kcfs. Low flow operations started at Little Goose on July 18th, transitioning from 30% spill to a flat spill rate of 7-11 kcfs as per guidance in the FOP.

Fish – Paul Wagner, NOAA, reported on fish passage. Adult summer Chinook at Grand Coulee were just over 100% of the 10-year average. Jacks are at 150% of the 10 year average. Russ Kiefer, Idaho, reported that Snake Sockeye counts so far are 204 over Bonneville; 137 over McNary; 107 over Ice Harbor and 60 over Lower Granite. This is the last push for Sockeye, as the last 1/3 attempt to pass. Paul also reported that Steelhead numbers are coming up and getting stronger at Bonneville, however, have not quite reached the 10 year average.

Sub-yearling counts are declining at all projects. At Lower Granite were 3-4,000/day, now are 2,000/day; 1,000-2,000/day at Little Goose and below 1,000/day at Lower Monumental. McNary passage is down to 40,000/day. At Bonneville and John Day counts are decreasing. Lamprey are decreasing with less than 100/day at McNary, Little Goose, John Day, and Bonneville.

Water quality – The June 2013 report for TDG exceedances has been posted to the TMT agenda.

Power system – Nothing to report.

Next Meeting, July 26 at 1:00 – check in regarding Lower Granite Adult Passage

Potential conference call scheduled for July 31st if needed

Next Face to Face meeting, August 7th at 9:00am.

An agenda will be developed prior to the meeting.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

July 24, 2013

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, Idaho, Montana, NOAA, BPA, BOR, CRITFC, USFWS, Colville Tribe, Oregon, Washington, Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of June 19 Meeting Minutes

There were no comments on the July 10 meeting notes or official minutes. They will be considered final unless future concerns are raised.

3. Updated SOR Distribution Lists

Lisa Wright, COE, showed TMT the updated list of Action Agency recipients for submitting SORs which is linked to this item on today's agenda. The list will be kept updated and posted to the TMT SOR webpage.

4. Lower Granite Adult Ladder Temperatures

TMT reviewed the Lower Granite special operation agreed to during yesterday's afternoon conference call. Today's discussion focused on criteria for deciding whether or not to continue the operation in an attempt to reduce the temperature differential between the adult ladder and the Lower Granite tailrace.

As spelled out in SOR 2013-4 (option 5 below), the operation is as follows: From 6 am through 6 pm, operate unit 1 as the priority unit, spilling through the RSW. From 6 pm to 6 am, operate to powerhouse station service (one unit at 5 kcfs) and spill the remainder of inflow not to exceed the gas cap. The LWG gas cap was 25 kcfs and will increase today to 26 kcfs

Discussion moved to next steps in addressing the temperature differential at Lower Granite. Ann Setter, COE Walla Walla, addressed the five options outlined in SOR 2013-4:

1. Cycle the navigation locks. This is not considered a viable alternative from an engineering standpoint. Deteriorating conditions already exist at the navigation gates, and the navigation lock spills deeper, cooler water. The structure was not built to handle the flows involved in implementing this alternative. Furthermore,

this option could move cold water out of the forebay into the tailrace, which could further increase temperatures in the forebay.

2. Reduce the contribution of the warmest gravity flow water into the ladder and increase cool water from Diffuser #14. In the short term, no bulkhead is available to implement this option so it would have to be evaluated from an engineering standpoint. One possibility is to maximize water flow through the trap, which would create an artificial draw on the fish ladder. Another possibility is to move minimal gravity surface flow at higher temperatures into the ladder. This would bring cooler water into the top of the ladder while keeping the forebay temperature at 22-24 degrees C.
3. Utilize multiple pumps to pull cooler water from deeper in the forebay into the ladder. This is not a feasible alternative because it only makes a difference of a tenth of a degree F.
4. Temporarily extend the diffuser intake into deeper water. FFDRWG will pursue this as a long term solution.
5. Modify operations as follows: (1) From 6 am to 6 pm, maximize powerhouse operations (unit 1 priority) while providing spill through the RSW. (2) From 6 pm to 6 am, operate to powerhouse station service and maximize spill. This operation went into effect after yesterday's TMT call.

In terms of cycling the locks, data indicate that sockeye are more likely to use the locks for passage than other salmonids, Russ Kiefer, Idaho, said. The intent is to break up stratification in the forebay and encourage sockeye stuck below Lower Granite Dam to move.

There was discussion of the effect of MOP operations on ladder temperatures. Erick Van Dyke, Oregon, recommended studying whether changes in operations can cause slight changes in ladder temperatures. Tom Lorz, CRITFC, said a 2011 analysis of long term alternatives for solving the Lower Granite fishway temperature problem is available on the COE Walla Walla district web site. Dave Statler, Nez Perce Tribe, and Erick Van Dyke, Oregon, requested that FFDRWG advise TMT on the status of this report. Further discussion of this aspect of the SOR was deferred to FFDRWG.

Baus asked TMT for feedback on the current operation, which is scheduled to end at 6 pm today. Russ Kiefer, Idaho, said the Salmon Managers envisioned a combined operation with use of turbine unit 1 during the day to provide attraction flows at the ladder entrance and gas cap spill at night to move warm water out of the forebay. This represents a tradeoff for adults, as the regular FOP spill operation is better for juveniles. Going to gas cap spill at night could reduce the temperature differential between the ladder and the tailrace, but is also likely to increase the tailrace temperature above the 68 degrees F criteria.

Breaking up stratification is a challenge in hot weather because stratification persists as the water moves downriver, Tony Norris, BPA, said. Kiefer said the main focus of operational changes should be on moving cool water into the Lower Granite ladder entrance. Setter suggested reducing Dworshak releases, but Dave Statler, Nez Perce, said making temperatures uniformly warm is not a good idea.

Jim Litchfield, Montana, said getting ladder temperature data is a crucial piece of information for evaluating the effectiveness of this operation. Focusing too narrowly on temperature changes could be misleading due to changes in the weather, Kiefer said. A threshold of success for the operation will be movement of adults upstream in significant numbers, Lorz said. Greg Moody, COE Walla Walla, said fish passage counts from last night will be available later today.

Password problems blocked project staff from downloading ladder temperature data, Kiefer reported. IDFG is prepared for an emergency trap and haul operation at Lower Granite within 24-48 hours if needed. David Wills, USFWS, proposed that TMT advise SCT, which last week began prioritizing FY14 CRFM projects, that funding is needed to address the Lower Granite ladder temperature issue. There's a \$17 million line item to upgrade the Lower Granite juvenile fish facility on the FY14 spreadsheet but no funding to address persistent problems at the dam's only adult fish ladder.

After caucusing to consider next steps, the Action Agencies proposed to continue the test operation at Lower Granite until 1800 hours tomorrow. Specifically as described in the SOR the AAs would implement the following: 1) from 0600 to 1800 hours operate unit 1 as the priority unit and continue to spill through the RSW and 2) from 1800 to 0600 hours operate to powerhouse station service and spill the remainder of inflow not to exceed the gas cap. Once this test operation was completed at 1800 hours on July 25 the AAs would resume normal unit priority operations as described in the FPP.

Wagner said beyond tomorrow evening would be appreciated, and Kiefer suggested extending the operation through the weekend. Due to the disagreement associated with the duration the AAs would continue with this test operation the TMT will reconvene at 1 pm on July 26 to evaluate real time data and determine the duration of continuing this test operation.

5. Dworshak Temperature Control Operation

Jeremy Giovando, COE, reported that Dworshak is currently discharging 11 kcfs, which will probably continue for a day or two. The COE will continue to run daily temperature models of Dworshak and post them to the TMT web page. Cooler temperatures are anticipated soon.

6. Treaty Fishing

SOR 2013-C4 and SOR 2013-C5, posted to this item on today's agenda, call for 1.5 foot flow bands for treaty fishing operations at the three Lower Columbia River pools from July 15-18 and July 22-25. There currently are 95 nets (45%) in the Bonneville pool, 59 nets (25%) in The Dalles pool, and 82 nets (35%) in the John Day pool, Kyle Dittmer, CRITFC, reported. Baus said the treaty fishing operation for SOR 2013-C4 is already completed and the operation for SOR 2013-C5 is currently underway. Dittmer thanked the Action Agencies for keeping the elevation bands within 1 foot, which the tribal fishers appreciate.

7. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3558.5 feet with releases of 2.8 kcfs, drafting slowly per the BiOp. Releases will probably drop to 2 kcfs by end August and 1.9 kcfs by end September.

Grand Coulee is at elevation 1288.8 feet. Libby is at elevation 2455.1 feet, with inflows of 14.2 kcfs and releases of 14 kcfs. Albeni Falls is at elevation 2062.4 feet, with inflows of 16.6 kcfs and releases of 12.8 kcfs. Dworshak is at elevation 1577.2 feet, with inflows of 1.1 kcfs and releases of 11.1 kcfs.

McNary daily average inflows are 172.2 kcfs. Lower Granite daily average inflows are 27.3 kcfs. Bonneville daily average inflows are 172.1 kcfs. On July 18, Little Goose transitioned to constant spill consistent per the FOP due to low flows, Baus reported. The project is currently spilling a constant 9 kcfs. In the event flows decline further, constant spill will transition to 7 kcfs.

b. Fish. Adults: There were 2054 PIT tagged Snake River sockeye detections at Bonneville and 134 at McNary, Kiefer reported. The summer chinook count at Lower Granite was more than 100% of the 10 year average, and the jack chinook count was 150% of the 10 year average. Steelhead passage is on the increase, with counts of 204 fish at Bonneville, 137 at McNary, 107 at Ice Harbor, and 67 at Lower Granite.

Juveniles: Subyearling passage numbers are on the decline at all projects after peaking a few weeks ago, Wagner reported. Lower Granite index counts declined from 4,000 to 2,000 fish per day. Little Goose is down to 1,000-2,000 per day, and Lower Monumental, less than 1,000 per day. McNary passage is down to 40,000 per day; the same is true of John Day and Bonneville. Lamprey counts are down to 100 per day at McNary, with decreasing numbers at John Day and Bonneville as well.

c. Water Quality. The June report of TDG exceedances is posted to the TMT web page.

d. Power System. There was nothing to report.

8. Next TMT Meeting

The next TMT meeting will be a conference call on July 26 at 1 pm with a possible conference call on July 31 at 9 am.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Russ Kiefer	Idaho
Jim Litchfield	Montana
Paul Wagner	NOAA
Lisa Wright	COE
Tony Norris	BPA
Scott Bettin	BPA
Laura Hamilton	COE
Dan Feil	COE
Bill Proctor	COE
Agnes Lut	BPA

Phone:

Mary Mellema	BOR
Tom Lorz	CRITFC
Dave Wills	USFWS
Sheri Sears	Colville
Erick Van Dyke	Oregon
Kyle Dittmer	CRITFC
Barry Espenson	CBB
Dave Benner	FPC
Margaret Filardo	FPC
Erin Cooper	FPC
Heather Dohan	Puget
Ann Setter	COE Walla Walla
Jeremy Giovando	COE
Derek Fryer	COE Walla Walla
Ben Feider	Lower Granite
Charles Morrill	Washington
Dave Statler	Nez Perce Tribe



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 NE Oregon, Suite 200, Portland, Oregon 97232

Telephone 503 238 0667

Fax 503 235 4228

SYSTEM OPERATIONAL REQUEST: 2013 C-4

TO:	Gen. Anthony Funkhouser	COE-NWD
	James D. Barton	COE-NWD-NP-Water Management
	Karl Kanbergs, Douglas Baus	COE-NWD-NP-WM-RCC
	D. Feil, R. Peters, D. Ponganis	COE-NWD-PDD (Fish Management Office)
	JR Inglis/Paul Cloutier	COE-Portland District/NWD (Tribal Liaison)
	Lorri Lee	USBR- PNW Regional Director
	Bill Drummond	BPA Administrator
	Steve Oliver, Greg Delwiche	BPA-PG-5
	Scott Bettin, Tony Norris	BPA-Operations Planning-PGPO
	Stan Speaks, Keith Hatch	BIA, Northwest Regional Office

FROM: B. Paul Lumley, *Executive Director*

DATE: July 11, 2013

SUBJECT: **Operation of the Lower Columbia Pools for the Summer 2013 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the summer 2013 Treaty fishery. This effort supports the 2013 ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

Monday, July 15, 2013, 6 am, through Thursday, July 18, 2013, 6 pm.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

JUSTIFICATION:

The 2013 summer treaty fishing season is of critical importance to CRITFC's member tribes. The escapement (Columbia at Bonneville Dam) of an estimated of **56,000** (near average) adult summer Upper Columbia Chinook and **154,000** sockeye (above average) will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day. The July 10, 2013 survey showed 326 nets in the Zone 6 pools, as follows: 101 (31%) in Bonneville, 80 (25%) in The Dalles, and 145 (44%) in John Day.

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become lost, continuing to catch fish, and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB, Friday July 12, 2013. Thank you for considering this request. Please contact Kyle Dittmer or Stuart Ellis should you have any questions at (503) 238-0667.

cc: Tribal staffs and attorneys



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 NE Oregon, Suite 200, Portland, Oregon 97232

Telephone 503 238 0667

Fax 503 235 4228

SYSTEM OPERATIONAL REQUEST: 2013 C-5

TO:	Col. John S. Kem	COE-NWD
	James D. Barton	COE-NWD-NP-Water Management
	Karl Kanbergs, Douglas Baus	COE-NWD-NP-WM-RCC
	D. Feil, R. Peters, D. Ponganis	COE-NWD-PDD (Fish Management Office)
	JR Inglis/Paul Cloutier	COE-Portland District/NWD (Tribal Liaison)
	Lorri Lee	USBR- PNW Regional Director
	Elliot Mainzer	Acting BPA Administrator
	Steve Oliver, Greg Delwiche	BPA-PG-5
	Scott Bettin, Tony Norris	BPA-Operations Planning-PGPO
	Stan Speaks, Keith Hatch	BIA, Northwest Regional Office

FROM: B. Paul Lumley, *Executive Director*

DATE: July 17, 2013

SUBJECT: **Operation of the Lower Columbia Pools for the Summer 2013 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the summer 2013 Treaty fishery. This effort supports the 2013 ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

Monday, July 22, 2013, 6 am, through Thursday, July 25, 2013, 6 pm.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

JUSTIFICATION:

The 2013 summer treaty fishing season is of critical importance to CRITFC's member tribes. The escapement (Columbia at Bonneville Dam) of an estimated of **61,000** (near average) adult summer Upper Columbia Chinook and **181,300** sockeye (above average) will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day. The July 17, 2013 survey showed 241 nets in the Zone 6 pools, as follows: 106 (44%) in Bonneville, 61 (25%) in The Dalles, and 74 (31%) in John Day.

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become lost, continuing to catch fish, and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB, Friday July 19, 2013. Thank you for considering this request. Please contact Kyle Dittmer or Stuart Ellis should you have any questions at (503) 238-0667.

cc: Tribal staffs and attorneys

To submit a System Operational Request (SORs), please use the distribution list below the relevant hydropower project. Updated 24 July 2013.

COE PORTLAND DISTRICT (NWP) HYDROPOWER PROJECTS

Bonneville Dam & Lake on Columbia River

The Dalles Dam & Lake Celilo on Columbia River

John Day Dam & Lake Umatilla on Columbia River

Corps of Engineers Northwestern Division (NWD) PORTLAND DISTRICT (NWP)	
TO:	
Col. John S. Kem	COE-NWD Commander
Col. John W. Eisenhower	COE-NWP Commander
David Combs	COE-NWD-PDD Chief
James Barton	COE-NWD-PDW Chief
Rock Peters	COE-NWD-PDD
William Proctor	COE-NWD-PDW-RC
Doug Baus	COE-NWD-PDW-RC
Karl Kanbergs	COE-NWD-PDW-RC
Bernard Klatte	COE-NWP-OD
Mary Karin Scullion	COE-NWP-EC
Lorri Lee	USBR-PN Regional Director
John Roache	USBR-PN-6208
Mary Mellema	USBR-PN-6204
Elliot Mainzer	BPA Administrator (Acting)
Steve Oliver	BPA-PG-5
Lori Bodi	BPA-KE-4
Holly Harwood	BPA-PGB
Robyn MacKay	BPA-PGB
Tony Norris	BPA-PGPO-5
Scott Bettin	BPA-KEWR-4
Agnes Lut	BPA-KEWR-4

Tribal Liaisons: Paul Cloutier (NWD), Jr. Inglis (NWP)

COE SEATTLE DISTRICT (NWS) HYDROPOWER PROJECTS

Libby Dam & Lake Koocanusa on Kootenai River

Hungry Horse Dam & Lake on South Fork Flathead River

Albeni Falls Dam & Pend Oreille Lake on Pend Oreille River

Chief Joseph Dam and Rufus Woods Lake on Columbia River

Corps of Engineers Northwestern Division (NWD) SEATTLE DISTRICT (NWS)	
TO:	
Col. John S. Kem	COE-NWD Commander
Col. Bruce A. Estok	COE-NWS Commander
David Combs	COE-NWD-PDD Chief
James Barton	COE-NWD-PDW Chief
Rock Peters	COE-NWD-PDD
William Proctor	COE-NWD-PDW-RC
Doug Baus	COE-NWD-PDW-RC
Karl Kanbergs	COE-NWD-PDW-RC
Joel Fenolio	COE-NWS-EN
Lorri Lee	USBR-PN Regional Director
John Roache	USBR-PN-6208
Mary Mellema	USBR-PN-6204
Elliot Mainzer	BPA Administrator (Acting)
Steve Oliver	BPA-PG-5
Lori Bodi	BPA-KE-4
Holly Harwood	BPA-PGB
Robyn MacKay	BPA-PGB
Tony Norris	BPA-PGPO-5
Scott Bettin	BPA-KEWR-4
Agnes Lut	BPA-KEWR-4

Tribal Liaisons: Paul Cloutier (NWD), Frances Morris (NWS)

To submit a System Operational Request (SORs), please use the distribution list below the relevant hydropower project. Updated 24 July 2013.

COE WALLA WALLA DISTRICT (NWW) HYDROPOWER PROJECTS

Dworshak Dam & Lake on North Fork Clearwater River

Lower Granite Dam & Lake on Snake River

Little Goose Dam & Lake Bryan on Snake River

Lower Monumental Dam & Lake Herbert G. West on Snake River

Ice Harbor Dam & Lake Sacajawea on Snake River

McNary Dam & Lake Wallula on Columbia River

**Corps of Engineers Northwestern Division (NWD)
WALLA WALLA DISTRICT (NWW)**

TO:

Col. John S. Kem	COE-NWD Commander
Lt. Col. Andrew D. Kelly	COE-NWW Commander
David Combs	COE-NWD-PDD Chief
James Barton	COE-NWD-PDW Chief
Rock Peters	COE-NWD-PDD
William Proctor	COE-NWD-PDW-RC
Doug Baus	COE-NWD-PDW-RC
Karl Kanbergs	COE-NWD-PDW-RC
Steve Hall	COE-NWW-EC
Ann Setter	COE-NWW-OD
Lorri Lee	USBR-PN Regional Director
John Roache	USBR-PN-6208
Mary Mellema	USBR-PN-6204
Elliot Mainzer	BPA Administrator (Acting)
Steve Oliver	BPA-PG-5
Lori Bodi	BPA-KE-4
Holly Harwood	BPA-PGB
Robyn MacKay	BPA-PGB
Tony Norris	BPA-PGPO-5
Scott Bettin	BPA-KEWR-4
Agnes Lut	BPA-KEWR-4

Tribal Liaisons: Paul Cloutier (NWD), Donna Turnipseed (NWW)

TDG INSTANCE TYPES

June 1 – June 31, 2013

Instances of when TDG levels exceed state water quality standards are classified into “types” which are shown on Table 1. These types are regionally approved and have been used since 2003. The states have requested information on TDG instances which include:

1. Date and times of exceedance
2. Amount of exceedance in percent saturation
3. Explain reason for exceedance
4. Discuss steps taken to fix the problem.

Because TDG instances are events when state TDG standards are exceeded, it is necessary to describe the current legal arrangement of how the state water quality standards are being implemented by the USACE. The 2013 Fish Operations Plan Court Order requires the Corps to operate according to the 2006 fixed monitoring station (FMS) system, and the 2006 state water quality standards which is referred to as “Roll-Over”. Therefore, the Camas/Washougal FMS, and the Oregon high 12-hour average calculation method are used to manage spill.

During the spill for fish passage season from April through August the Washington Department of Ecology (WDOE) has issued a temporary %TDG Rule Adjustment to their current water quality standards and Oregon Department of Environmental Quality (ODEQ) issued a 5-year %TDG Waiver. The state water quality standards are calculated differently from one another, and also from the 2006 Roll-Over.

USACE is currently tracking and recording the current state water quality standards as follows.

Oregon: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/or/

Washington: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/wa/

Combined - OR & WA: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/

Table 2 provides the TDG instances according to the Oregon high 12-hour average calculation method that occurred in the June 2013 spill for fish passage season.

Table 1

Types of Instance	
Type 1 Condition	TDG levels exceed the TDG standard due to exceeding powerhouse capacity at run-of-river projects resulting in spill above the BiOp fish spill levels. This condition type includes:
	• High runoff flows and flood control efforts. • BPA load requirements are lower than actual powerhouse capacity. • Involuntary spill at Mid Columbia River dams resulting in high TDG levels entering the lower Columbia River. • Involuntary spill at Snake River dams resulting in high TDG levels entering the lower Columbia River.
Type 1a Condition	Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.
Type 2 Exceedance	TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:
	• Flow deflectors unable to function for TDG abatement with tailwater elevations above 19 - 26 feet at Bonneville Dam. • Spill gates stuck in open position or inadvertently left open. • Increased spill in a bulk spill operation to pass debris. • Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.
Type 2a Exceedance	Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.
Type 3 Exceedance	TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:
	• Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns. • Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time. • Uncertainties when using forecasts for flows, temperature and wind. • Unanticipated sharp rise in water temperature (a 1.5 degree F. or greater change in a day). • Bulk spill pattern being used which generated more TDG than expected.

Table 2
Types of TDG Instances
June 2013

DATE	Lower Granite FB	Lower Granite TW	Little Goose FB	Little Goose TW	Lower Monum. FB	Lower Monum. TW	Ice Harbor FB	Ice Harbor TW	Chief Joseph FB	Chief Joseph TW	McNary FB	McNary TW	John Day FB	John Day TW	The Dalles FB	The Dalles TW	Bon FB	Bon TW	Camas FB
6/1/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/2/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/3/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/4/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/5/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	---	3
6/6/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	---	3
6/7/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/8/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/9/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/10/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/11/2013	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/12/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/13/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/14/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/15/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/16/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/17/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/18/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/19/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/20/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/21/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/22/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/23/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
6/24/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
6/25/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/26/2013	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	---	---	---	---	---
6/27/2013	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	---	---	3	---	3
6/28/2013	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	---	---	3	---	3
6/29/2013	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	3	---	3
6/30/2013	---	---	1	---	---	---	---	---	---	---	1	---	1	---	3	---	3	---	1
Total	0	0	1	0	0	0	11	0	0	0	2	3	1	0	1	0	8	0	12
Grand Total = 39																			

TECHNICAL MANAGEMENT TEAM

NOAA:	<i>Paul Wagner / Richard Domingue</i>	USFWS:	<i>David Wills / Steve Haeseker</i>
OR:	<i>Erick Van Dyke</i>	ID:	<i>Russ Kiefer / Pete Hassemer</i>
WA:	<i>Charles Morrill</i>	MT:	<i>Jim Litchfield / Brian Marotz</i>
Kootenai:	<i>Sue Ireland / Billy Barquin</i>	Spokane:	<i>Andy Miller</i>
Colville:	<i>Sheri Sears / Keith Wolf</i>	Nez Perce:	<i>Dave Statler</i>
Umatilla:	<i>Tom Lorz (CRITFC)</i>	Salish-Kootenai:	<i>Stu Levit</i>
BPA:	<i>Tony Norris / Scott Bettin / Robyn MacKay</i>	BOR:	<i>John Roache / Mary Mellema / Pat McGrane</i>
COE:	<i>Doug Baus / Karl Kanbergs</i>		

TMT CONFERENCE CALL

Friday July 26, 2013 1:00pm - 2:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 8515

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**We have had disruptions when people do not mute their phones.
Please MUTE your phone.**

*All members are encouraged to contact Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Lower Granite Dam Operations for Adult Ladder Temperature Issues - Doug Baus, COE NWD / Russ Kiefer, Idaho
 - a. [SOR 2013-4](#)
 - b. [Hourly Project Data and Operations, July 23-26](#)
 - c. [*UPDATED DAILY* Adult Passage Count Data, July 23-26](#)
 - d. [*UPDATED DAILY* Ladder Temperature Data, July 20-26](#)
3. Lower Granite Dam Adult Sockeye Transportation - Paul Wagner, NOAA Fisheries / Russ Kiefer, Idaho
4. Other
 - a. Set agenda and date for next meeting - **July 31, 2013**

b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

Adult Count Data - DAILY TOTALS for Lower Snake River Projects, July 19-25 (FPC)

Site	Date	Chinook Adult	Chinook Jack	Coho	Sockeye	Steelhead clipped	Steelhead unclipped	Lamprey	Shad
IHR	Fri, 19-Jul	76	22	0	6	203	77	4	362
IHR	Sat, 20-Jul	39	42	0	6	198	83	7	495
IHR	Sun, 21-Jul	72	21	0	2	284	73	15	461
IHR	Mon, 22-Jul	55	18	0	6	243	74	6	206
IHR	Tue, 23-Jul	40	16	0	2	220	79	7	209
IHR	Wed, 24-Jul	33	10	0	4	186	52	0	127
IHR	Thu, 25-Jul	32	11	0	4	245	77	6	91
IHR	2013YTD	48,926	24,809	0	870	8,506	2,676	107	191,435

LMN	Fri, 19-Jul	84	34	0	9	192	62	1	
LMN	Sat, 20-Jul	102	34	0	11	151	44	1	
LMN	Sun, 21-Jul	85	31	0	3	171	56	2	
LMN	Mon, 22-Jul	76	24	0	7	134	46	1	
LMN	Tue, 23-Jul	56	19	0	5	183	76	0	
LMN	Wed, 24-Jul	43	9	0	2	165	62	0	
LMN	2013YTD	47,215	26,494	0	988	5,810	2,320	31	n/a

LGS	Fri, 19-Jul	65	50	0	23	48	31	0	
LGS	Sat, 20-Jul	112	52	0	14	55	26	0	
LGS	Sun, 21-Jul	148	65	0	17	60	34	0	
LGS	Mon, 22-Jul	83	34	0	7	64	29	0	
LGS	Tue, 23-Jul	48	38	0	6	82	52	1	
LGS	Wed, 24-Jul	55	30	0	6	89	49	2	
LGS	Thu, 25-Jul	72	23	0	2	93	43	0	
LGS	2013YTD	44,092	26,790	0	935	3,552	1,735	13	n/a

LWG	Fri, 19-Jul	4	6	0	1	16	10	0	46
LWG	Sat, 20-Jul	-4	11	0	1	18	11	0	48
LWG	Sun, 21-Jul	23	14	0	4	12	5	-1	34
LWG	Mon, 22-Jul	20	11	0	6	16	10	0	74
LWG	Tue, 23-Jul	0	22	0	2	19	7	1	49
LWG	Wed, 24-Jul	11	14	0	2	17	10	1	138
LWG	Thu, 25-Jul	204	170	0	26	95	54	0	110
LWG	2013YTD	42,370	26,668	0	600	8,152	3,518	5	1,610

http://www.fpc.org/currentdaily/PrintIHR-LGR_Histfishtwo7day-ytd_Adults.asp

Adult Count Data - HOURLY TOTALS for LWG Nightly Video Counts 21:00-05:00, July 23-25

			Lamprey		Sockeye		Chinook Adult		Chinook Jack		Steelhead clipped		Steelhead unclipped		Coho Adult		Coho Jack		Shad	
Date	Hour	Operation	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue, 23-Jul	2100-2200	Unit 5 station service (5k) + Spill ≤ TDG cap (25k)	1			1							1							1
Tue, 23-Jul	2200-2300																			
Tue, 23-Jul	2300-0000																			
Wed, 24-Jul	0000-0100																			
Wed, 24-Jul	0100-0200																			
Wed, 24-Jul	0200-0300																			
Wed, 24-Jul	0300-0400																			
Wed, 24-Jul	0400-0500																			
Nightly Total Net Pass			1	0	0	0	2	2	1	0	0	1	0	0	0	0	0	0	1	2
			1		0		-2		1		0		1		0		0		-1	
Wed, 24-Jul	2100-2200	Unit 5 station service (5k) + Spill ≤ TDG cap (26k)	1			1													1	2
Wed, 24-Jul	2200-2300																			
Wed, 24-Jul	2300-0000																			
Thu, 25-Jul	0000-0100																			
Thu, 25-Jul	0100-0200																			
Thu, 25-Jul	0200-0300																			
Thu, 25-Jul	0300-0400																			
Thu, 25-Jul	0400-0500																			
Nightly Total Net Pass			1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	5	2
			1		0		-1		1		0		0		0		0		3	

Daily Report LGR T

7/23/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	skad	lamprey	all pk	all ke
1	8	0	6	0	0	0	0	0	0	0	0	0			1	0	1	0
2	20	-17	12	-9	1	-1	1	0	0	0	0	0			0	0	0	0
3	29	-24	33	-14	7	-1	3	-1	1	0	0	0			1	0	0	0
4	17	-20	23	-28	2	-1	1	0	0	0	0	0			1	-1	0	0
5	4	-5	1	-7	1	-3	1	-1	0	0	0	0			3	0	0	0
6	7	-14	2	0	2	0	1	-1	0	0	0	0			3	0	0	0
7	2	-5	0	0	0	-1	0	0	0	-1	0	0			2	0	0	0
8	5	-5	0	-2	6	-2	2	0	0	0	1	0			6	0	0	0
Su	2		17		10		6		0		1				16		1	
Total	2		20		12		7		0		1				19		1	
* 1.2:																		

Unit 1 priority after hour 2 + spill patter LWG-12
0600 - 1800 hrs

Daily Report LGR T

7/24/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	shad		lamprey		all pk	all ke
1	2	-2	1	-2	0	0	0	0	0	0	0	0			0	0	1	0		
2	1	0	1	0	1	0	3	0	0	0	0	0			0	0	0	0		
3	2	0	2	-1	2	0	2	-1	0	0	0	0			0	0	0	0		
4	6	-6	5	-4	2	0	0	-2	0	0	0	0			3	0	0	0		
5	7	-10	9	-4	2	-4	2	-2	0	-1	0	0			1	0	0	0		
6	2	-1	2	-2	2	-1	0	0	0	0	0	0			5	0	0	0		
7	19	-10	8	-8	0	0	2	0	0	0	0	0			18	0	0	0		
8	3	-5	0	0	1	-2	1	0	0	0	0	0			7	0	0	0		
Su	8		7		3		5		-1		0				34		1			
Total	10		8		4		6		-1		0				41		1			
* 1.2:																				

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2013-07-24 13:52

Daily Report LGR T

7/25/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	shad	lamprey	all pk	all ke
1	1	0	0	0	0	0	4	-1	0	0	0	0			1	0	0	0
2	0	-1	0	0	1	0	4	-3	0	0	0	0			0	0	0	0
3	8	-2	5	-1	5	0	4	0	0	0	0	0			0	0	0	0
4	19	-14	18	-5	4	-1	2	0	1+	0	1x	0			0	0	0	0
5	24	-9	14	-5	6	0	4	-1	2x	0	0	0			9	0	0	0
6	17	-6	16	-3	1	0	2	0	2x	0	0	0			3	0	0	0
7	28	-14	14	-2	4	0	9	-3	3-	0	1-	0			4	0	0	0
8	22	-11	15	-6	2	-1	3	0	0	0	1-	0			5	0	0	0
Su	62		60		21		24		8		3				22		0	
Total	74		72		25		29		10		4				26		0	
* 1.2:																		

* Turning Red Good Shape

L one with Fungus
one Good Shape

- Good Shape

LWG Night Video Count			Lamprey		Sockeye		Chinook Adult		Chinook Jack		Steelhead clipped		Steelhead unclipped		Coho Adult		Coho Jack		Shad	
Date	Hour	OPERATION	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue, 23-Jul	2100-2200	Unit 5 station service (5k) + Spill ≤ TDG cap (25k)	1			1							1							1
Tue, 23-Jul	2200-2300																			
Tue, 23-Jul	2300-0000																			
Wed, 24-Jul	0000-0100																			
Wed, 24-Jul	0100-0200																			
Wed, 24-Jul	0200-0300																			
Wed, 24-Jul	0300-0400																			
Wed, 24-Jul	0400-0500	1	1																	
Nightly Total			1	0	0	0	2	2	1	0	0	1	0	0	0	0	0	0	1	2
Net Pass			1		0		-2	1		0		1		0		0		-1		
Wed, 24-Jul	2100-2200	Unit 5 station service (5k) + Spill ≤ TDG cap (26k)	1			1							1	1					1	2
Wed, 24-Jul	2200-2300																			
Wed, 24-Jul	2300-0000																			
Thu, 25-Jul	0000-0100																			
Thu, 25-Jul	0100-0200																			
Thu, 25-Jul	0200-0300																			
Thu, 25-Jul	0300-0400																			
Thu, 25-Jul	0400-0500	1	1																	
Nightly Total			1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	5	2
Net Pass			1		-1		0	1		0		0		0		0		3		

Daily Report LGR T

7/23/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	skad		lamprey		all pk	all ke
1	8	0	6	0	0	0	0	0	0	0	0	0			1	0	1	0		
2	20	-17	12	-9	1	-1	1	0	0	0	0	0			0	0	0	0		
3	29	-24	33	-14	7	-1	3	-1	1	0	0	0			1	0	0	0		
4	17	-20	23	-28	2	-1	1	0	0	0	0	0			1	-1	0	0		
5	4	-5	1	-7	1	-3	1	-1	0	0	0	0			3	0	0	0		
6	7	-14	2	0	2	0	1	-1	0	0	0	0			3	0	0	0		
7	2	-5	0	0	0	-1	0	0	0	-1	0	0			2	0	0	0		
8	5	-5	0	-2	6	-2	2	0	0	0	1	0			6	0	0	0		
Su	2		17		10		6		0		1				16		1			
Total	2		20		12		7		0		1				19		1			
* 1.2:																				

Unit 1 priority after hour 2 + spill patter LWG-12
0600 - 1800 hrs

Daily Report LGR T

7/24/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	shad		lamprey		all pk	all ke
1	2	-2	1	-2	0	0	0	0	0	0	0	0			0	0	1	0		
2	1	0	1	0	1	0	3	0	0	0	0	0			0	0	0	0		
3	2	0	2	-1	2	0	2	-1	0	0	0	0			0	0	0	0		
4	6	-6	5	-4	2	0	0	-2	0	0	0	0			3	0	0	0		
5	7	-10	9	-4	2	-4	2	-2	0	-1	0	0			1	0	0	0		
6	2	-1	2	-2	2	-1	0	0	0	0	0	0			5	0	0	0		
7	19	-10	8	-8	0	0	2	0	0	0	0	0			18	0	0	0		
8	3	-5	0	0	1	-2	1	0	0	0	0	0			7	0	0	0		
Su	8		7		3		5		-1		0				34		1			
Total	10		8		4		6		-1		0				41		1			
* 1.2:																				

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1140 >>

Orion

2013-07-24 13:52

Daily Report LGR T

7/25/2013

hour	adult chinook		jack chinook		clipped steelhead		unclipped steelhead		adult sockeye		jack sockeye		adult coho	jack coho	shad	lamprey	all pk	all ke
1	1	0	0	0	0	0	4	-1	0	0	0	0			1	0	0	0
2	0	-1	0	0	1	0	4	-3	0	0	0	0			0	0	0	0
3	8	-2	5	-1	5	0	4	0	0	0	0	0			0	0	0	0
4	19	-14	18	-5	4	-1	2	0	1+	0	1x	0			0	0	0	0
5	24	-9	14	-5	6	0	4	-1	2x	0	0	0			9	0	0	0
6	17	-6	16	-3	1	0	2	0	2g	0	0	0			3	0	0	0
7	28	-14	14	-2	4	0	9	-3	3-	0	1-	0			4	0	0	0
8	22	-11	15	-6	2	-1	3	0	0	0	1-	0			5	0	0	0
Su	62		60		21		24		8		3				22		0	
Total	74		72		25		29		10		4				26		0	
* 1.2:																		

* Turning Red Good Shape

L one with Fungus
one Good Shape

- Good Shape

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 22, 2013					
	GROSS	STA	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG	SUPR	UNIT	STATUS		
	GEN	USE	--	IN KCFS	--	IN FEET + MSL		HEAD	CAP	ON	ON	LWSI	
	MW	MW	TOTAL	POWER	SPILL	FOREBAY	TAILWATR	FT	MW	RMT	LINE	AVL	GAGE
													ELEV
1		1	25.50	11.80	13.40	735.42	633.09	102.33					735.46
2		1	27.20	11.80	13.50	735.45	633.29	102.16					735.46
3		1	25.60	11.80	13.50	735.46	633.07	102.39					735.46
4		2	25.70	11.90	13.50	735.47	633.03	102.44					735.46
5		1	25.70	11.90	13.50	735.48	633.09	102.39					735.46
6		1	25.80	12.00	13.60	735.54	633.05	102.49					735.46
7		1	25.80	11.90	13.60	735.58	632.97	102.61					735.46
8		1	30.70	12.00	18.30	735.50	633.50	102.00					735.46
9		1	30.70	12.00	18.50	735.51	633.36	102.15					735.46
10		1	30.60	11.90	18.50	735.48	633.44	102.04					735.46
11		1	30.80	12.00	18.50	735.43	633.50	101.93					735.46
12		1	30.80	12.00	18.50	735.43	633.47	101.96					735.52
13		1	28.70	11.90	16.50	735.42	633.25	102.17					735.52
14		1	28.60	11.80	16.50	735.36	633.26	102.10					735.52
15		2	28.50	11.80	16.50	735.36	633.22	102.14					735.52
16		2	28.60	11.80	16.50	735.39	633.29	102.10					735.52
17		2	25.80	15.00	10.50	735.40	633.34	102.06					735.52
18		1	24.00	16.80	6.90	735.40	633.32	102.08					735.51
19		1	24.00	16.90	6.90	735.45	633.38	102.07					735.51
20		1	24.10	16.90	6.90	735.47	633.25	102.22					735.51
21		1	24.10	16.90	6.90	735.52	633.27	102.25					735.51
22		1	25.80	16.90	6.90	735.55	633.48	102.07					735.51
23		1	24.00	16.90	6.90	735.59	633.26	102.33					735.51
24		1	24.00	16.90	6.90	735.60	633.21	102.39					735.51
TOT		35											
AVG		1	26.88	13.48	12.99	735.47	633.27	102.20					735.49
MAX			30.80	16.90	18.50	735.60	633.50	102.61					735.52
MIN			24.00	11.80	6.90	735.36	632.97	101.93					735.46

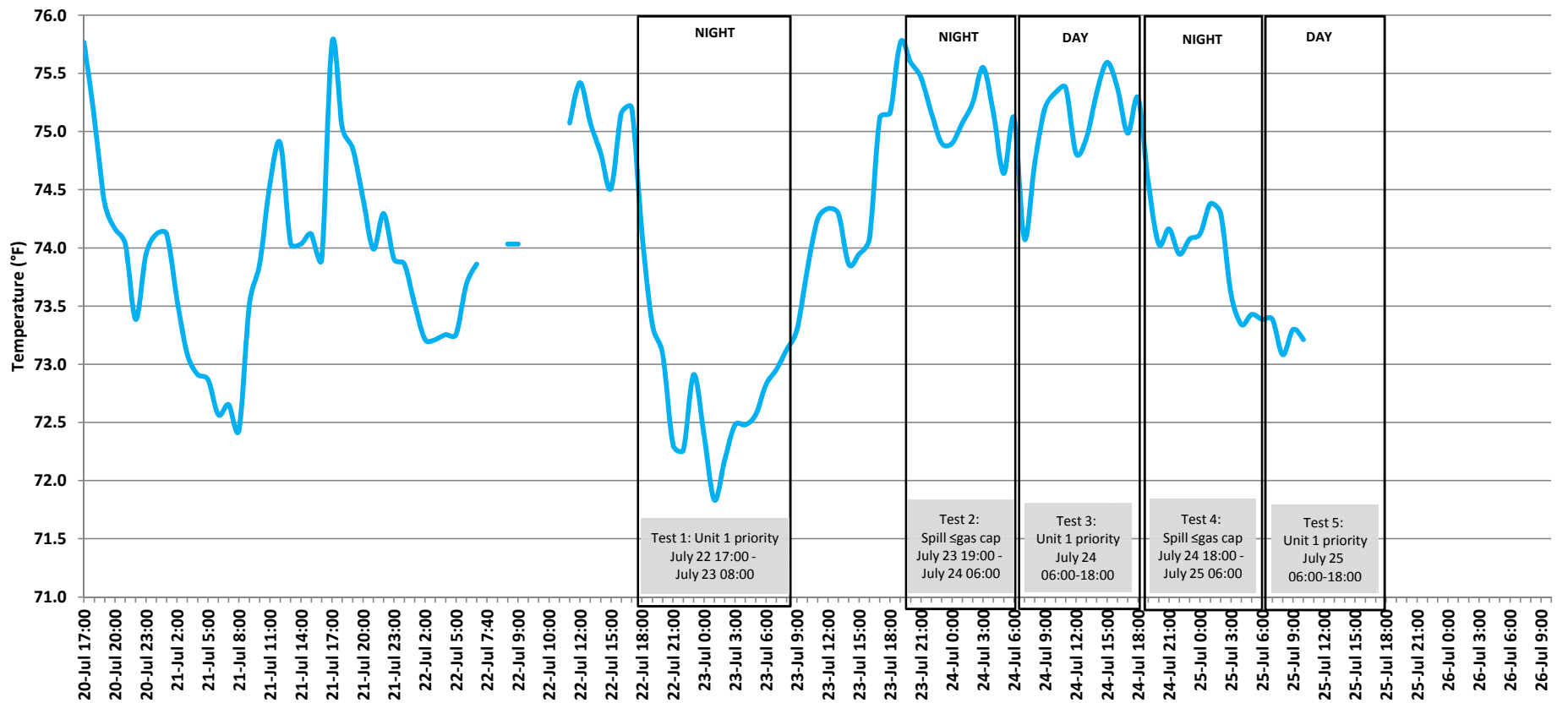
1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM	Tuesday July 23, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.70	16.80	6.90	735.63	633.56	102.07				735.51
2		1	24.00	16.80	6.90	735.65	633.20	102.45				735.51
3		1	24.20	16.90	7.10	735.66	633.27	102.39				735.51
4		1	27.30	16.90	10.10	735.67	633.24	102.43				735.51
5		1	27.50	17.00	10.20	735.71	632.92	102.79				735.51
6		1	27.50	16.90	10.30	735.72	633.16	102.56				735.51
7		1	27.40	16.90	10.30	735.75	633.11	102.64				735.51
8		1	27.90	17.30	10.40	735.72	633.00	102.72				735.51
9		2	27.30	11.90	15.10	735.77	633.09	102.68				735.74
10		1	27.20	11.80	15.10	735.78	633.07	102.71				735.74
11		1	27.20	11.80	15.10	735.76	633.10	102.66				735.74
12		1	27.00	11.60	15.10	735.77	633.12	102.65				735.74
13		1	27.20	11.70	15.20	735.72	633.08	102.64				735.74
14		2	26.90	11.60	15.10	735.75	633.10	102.65				735.74
15		2	27.10	11.70	15.00	735.71	633.15	102.56				735.74
16		2	28.70	11.60	15.10	735.70	633.26	102.44				735.74
17		2	27.20	11.70	15.10	735.72	633.07	102.65				735.74
18		1	27.10	11.70	15.20	735.74	633.10	102.64				735.74
19		1	26.70	11.20	15.20	735.71	633.12	102.59				735.74
20		1	30.30	5.00	25.00	735.65	633.13	102.52				735.74
21		1	30.60	5.00	25.30	735.62	633.12	102.50				735.74
22		1	30.40	5.00	25.10	735.57	633.11	102.46				735.74
23		1	30.30	5.00	25.00	735.54	633.23	102.31				735.74
24		1	28.20	5.00	22.90	735.54	633.30	102.24				735.74
TOT		35										
AVG		1	27.54	12.03	15.07	735.69	633.15	102.54				735.66
MAX			30.60	17.30	25.30	735.78	633.56	102.79				735.74
MIN			24.00	5.00	6.90	735.54	632.92	102.07				735.51

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG	LOWER GRANITE DAM	Wednesday July 24, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	28.20	5.00	22.90	735.52	633.33	102.19				735.74
2		1	28.00	5.00	22.70	735.52	633.35	102.17				735.74
3		1	27.90	5.00	22.60	735.53	633.37	102.16				735.74
4		1	28.00	5.00	22.70	735.52	633.43	102.09				735.74
5		1	28.10	5.00	22.80	735.52	633.37	102.15				735.74
6		1	29.60	7.00	22.30	735.51	633.43	102.08				735.74
7		1	26.90	16.90	9.60	735.56	633.52	102.04				735.74
8		1	27.20	17.00	10.00	735.54	633.43	102.11				735.74
9		1	27.40	17.10	10.00	735.56	633.61	101.95				735.74
10		1	27.40	17.10	10.00	735.58	633.48	102.10				735.74
11		1	27.40	17.10	10.00	735.56	633.24	102.32				735.74
12		1	27.30	17.10	9.90	735.56	633.38	102.18				735.74
13		1	29.00	17.10	9.90	735.58	633.36	102.22				735.74
14		1	27.10	17.00	9.80	735.54	633.09	102.45				735.74
15		2	27.20	17.10	9.90	735.54	633.21	102.33				735.74
16		1	27.30	17.00	10.00	735.57	633.20	102.37				735.74
17		1	27.30	17.00	10.00	735.59	633.25	102.34				735.74
18		1	26.90	16.40	10.20	735.58	633.17	102.41				735.74
19		1	28.70	5.00	23.40	735.56	633.19	102.37				735.74
20		1	28.70	5.00	23.40	735.54	633.22	102.32				735.74
21		1	28.70	5.00	23.40	735.52	633.29	102.23				735.74
22		2	28.70	5.00	23.40	735.50	633.26	102.24				735.74
23		1	28.70	5.00	23.40	735.47	633.32	102.15				735.74
24		1	28.70	5.00	23.40	735.48	633.39	102.09				735.74
TOT		35										
AVG		1	27.93	11.08	16.49	735.54	633.33	102.21				735.74
MAX			29.60	17.10	23.40	735.59	633.61	102.45				735.74
MIN			26.90	5.00	9.60	735.47	633.09	101.95				735.74

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Thursday July 25, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	28.60	5.00	23.30	735.46	633.32	102.14				735.74
2		1	28.50	5.00	23.20	735.44	633.37	102.07				735.74
3		1	28.50	5.00	23.20	735.43	633.31	102.12				735.74
4		1	28.50	5.00	23.20	735.42	633.38	102.04				735.74
5		1	26.40	5.00	21.10	735.41	633.31	102.10				735.74
6		1	26.60	5.00	21.30	735.37	633.40	101.97				735.74
7		1	27.50	16.60	10.60	735.39	633.50	101.89				735.74
8		2	27.60	17.10	10.20	735.38	633.48	101.90				735.74
9		2	27.60	17.10	10.10	735.37	633.57	101.80				735.74
10		2	29.20	17.00	10.10	735.35	633.21	102.14				735.74
11		2	28.60	18.20	10.10	735.34	633.47	101.87				735.74
12		2	27.30	17.00	10.00	735.35	633.49	101.86				735.74
13		2	27.30	17.00	10.00	735.29	633.24	102.05				735.74
14		2	27.30	17.00	10.00	735.28	633.43	101.85				735.74
15		2	33.60	23.40	9.90	735.24	633.73	101.51				735.74
16		2	27.20	17.00	9.90	735.23	633.30	101.93				735.74
17		2	27.30	17.20	9.90	735.21	633.35	101.86				735.49
18		2	27.70	17.50	9.90	735.05	633.29	101.76				735.49
19		2	22.40	12.20	9.90	735.21	633.13	102.08				735.49
20		2	22.20	11.90	9.90	735.22	633.40	101.82				735.49
21		2	22.30	12.00	9.90	735.22	633.15	102.07				735.49
22		2	22.20	12.00	10.00	735.30	633.00	102.30				735.49
23		2	23.30	11.90	11.10	735.28	633.12	102.16				735.49
24		2	25.40	11.90	13.20	735.28	632.81	102.47				735.49
TOT		37										
AVG		2	26.80	13.08	13.33	735.31	633.32	101.99				735.66
MAX			33.60	23.40	23.30	735.46	633.73	102.47				735.74
MIN			22.20	5.00	9.90	735.05	632.81	101.51				735.49

1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM Friday July 26, 2013						
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.30	11.90	13.10	735.32	632.72	102.60				735.49
2		2	25.40	12.00	13.10	735.31	632.99	102.32				735.49
3		2	27.00	11.90	13.10	735.26	632.89	102.37				735.49
4		2	25.30	11.80	13.20	735.30	632.60	102.70				735.49
5		2	25.60	11.90	13.30	735.33	632.84	102.49				735.49
6		2	25.50	11.80	13.40	735.38	632.74	102.64				735.49
7		2	29.60	11.90	17.30	735.35	633.16	102.19				735.49
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
TOT		11										
AVG		2	26.24	11.89	13.79	735.32	632.85	102.47				735.49
MAX			29.60	12.00	17.30	735.38	633.16	102.70				735.49
MIN			25.30	11.80	13.10	735.26	632.60	102.19				735.49

LWG Adult Ladder Exit Temp (°F)



Date Time (PST)	Temp (°F)
20-Jul 17:00	75.77
20-Jul 18:00	75.12
20-Jul 19:00	74.38
20-Jul 20:00	74.16
20-Jul 21:00	74.03
20-Jul 22:00	73.39
20-Jul 23:00	73.95
21-Jul 0:00	74.12
21-Jul 1:00	74.12
21-Jul 2:00	73.56
21-Jul 3:00	73.08
21-Jul 4:00	72.91
21-Jul 5:00	72.87
21-Jul 6:00	72.57
21-Jul 7:00	72.65
21-Jul 8:00	72.44
21-Jul 9:00	73.52
21-Jul 10:00	73.86
21-Jul 11:00	74.55
21-Jul 12:00	74.90
21-Jul 13:00	74.03
21-Jul 14:00	74.03
21-Jul 15:00	74.12
21-Jul 16:00	73.90
21-Jul 17:00	75.77
21-Jul 18:00	75.03
21-Jul 19:00	74.86
21-Jul 20:00	74.42
21-Jul 21:00	73.99
21-Jul 22:00	74.30
21-Jul 23:00	73.90
22-Jul 0:00	73.86
22-Jul 1:00	73.52
22-Jul 2:00	73.21
22-Jul 3:00	73.21
22-Jul 4:00	73.26
22-Jul 5:00	73.26
22-Jul 6:00	73.69
22-Jul 7:00	73.86
22-Jul 7:40	
22-Jul 7:49	
22-Jul 8:00	74.03
22-Jul 9:00	74.03
22-Jul 9:50	
22-Jul 9:52	
22-Jul 10:00	75.03
22-Jul 10:21	
22-Jul 11:00	75.07
22-Jul 12:00	75.42
22-Jul 13:00	75.07
22-Jul 14:00	74.81
22-Jul 15:00	74.51
22-Jul 16:00	75.16
22-Jul 17:00	75.20

Date Time (PST)	Temp (°F)
22-Jul 18:00	74.12
22-Jul 19:00	73.34
22-Jul 20:00	73.08
22-Jul 21:00	72.31
22-Jul 22:00	72.26
22-Jul 23:00	72.91
23-Jul 0:00	72.39
23-Jul 1:00	71.83
23-Jul 2:00	72.18
23-Jul 3:00	72.48
23-Jul 4:00	72.48
23-Jul 5:00	72.57
23-Jul 6:00	72.83
23-Jul 7:00	72.96
23-Jul 8:00	73.13
23-Jul 9:00	73.30
23-Jul 10:00	73.82
23-Jul 11:00	74.25
23-Jul 12:00	74.34
23-Jul 13:00	74.30
23-Jul 14:00	73.86
23-Jul 15:00	73.95
23-Jul 16:00	74.08
23-Jul 17:00	75.12
23-Jul 18:00	75.16
23-Jul 19:00	75.77
23-Jul 20:00	75.59
23-Jul 21:00	75.46
23-Jul 22:00	75.16
23-Jul 23:00	74.90
24-Jul 0:00	74.90
24-Jul 1:00	75.07
24-Jul 2:00	75.25
24-Jul 3:00	75.55
24-Jul 4:00	75.16
24-Jul 5:00	74.64
24-Jul 6:00	75.12
24-Jul 7:00	74.08
24-Jul 8:00	74.73
24-Jul 9:00	75.20
24-Jul 10:00	75.33
24-Jul 11:00	75.38
24-Jul 12:00	74.81
24-Jul 13:00	74.94
24-Jul 14:00	75.33
24-Jul 15:00	75.59
24-Jul 16:00	75.38
24-Jul 17:00	74.99

Date Time (PST)	Temp (°F)
24-Jul 18:00	75.29
24-Jul 19:00	74.55
24-Jul 20:00	74.03
24-Jul 21:00	74.16
24-Jul 22:00	73.95
24-Jul 23:00	74.08
25-Jul 0:00	74.12
25-Jul 1:00	74.38
25-Jul 2:00	74.30
25-Jul 3:00	73.60
25-Jul 4:00	73.34
25-Jul 5:00	73.43
25-Jul 6:00	73.39
25-Jul 7:00	73.39
25-Jul 8:00	73.08
25-Jul 9:00	73.30
25-Jul 10:00	73.21
25-Jul 11:00	
25-Jul 12:00	
25-Jul 13:00	
25-Jul 14:00	
25-Jul 15:00	
25-Jul 16:00	
25-Jul 17:00	
25-Jul 18:00	
25-Jul 19:00	
25-Jul 20:00	
25-Jul 21:00	
25-Jul 22:00	
25-Jul 23:00	
26-Jul 0:00	
26-Jul 1:00	
26-Jul 2:00	
26-Jul 3:00	
26-Jul 4:00	
26-Jul 5:00	
26-Jul 6:00	
26-Jul 7:00	
26-Jul 8:00	
26-Jul 9:00	
26-Jul 10:00	

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 26, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Lower Granite Adults Ladder Temperatures

A phone call was convened to revisit this issue with updated information. Ann Setter and other Corps Walla Walla staff informed TMT that as of this morning, water levels at the trap were down about 4 inches at 6:00 this morning, then down about 8 inches by 8:00, which was preventing fish from entering/moving through. This came as a surprise as this did not appear to be a problem the evening before. The Corps' best professional judgment about why this is happening was that the additional auxiliary pumps installed on Thursday morning caused air entrainment and reduced water pressure, resulting in not enough water depth at the false weir to operate the trap. The Corps was troubleshooting this issue and Ann described the steps being taken to understand and address the problem. She noted they took a pump offline so that Diffuser #14 will automatically adjust and bring the pressure back up to get more water through. As of 12:45 this afternoon, temperature in the ladder was 70.6°F and water levels were still too low to operate the trap.

The Corps planned to continue to work on stabilizing the water supply so the level at the trap does not go down, within an 'acceptable' temperature differential between ladder and tailrace. Air temperatures remained high in the area as of today. Ann said they want to keep fish moving through and out of the ladder as they are worried also about the potential for adults holding in the exit pool of the fishway.

Russ Kiefer, Idaho, thanked everyone for their efforts to problem solve together and find solutions to alleviate the current problem at Lower Granite. Idaho Fish and Game was prepared to trap and haul if fish were collected. He suggested a possible operation for day time to keep the fish moving, while working with the evening hours to support collection of the fish.

Greg Moody, Corps, reported on fish counts: last night, 2 sockeye passed and there had been an increase in lamprey passage. Today, fish were going up and down the ladder, which from his perspective was a significant change from yesterday to today. Paul Wagner, NOAA, asked if the Corps would recommend a return to the Unit 1 priority operation that worked best yesterday, in hopes it will have the same positive effect again? Russ Keifer added that maybe the Corps should do its best to stabilize conditions in the adult ladder, then operate Unit 1 during the day. Specifically, turn auxiliary pump 2 on during the day to cool temperature in the ladder, then turn it off at night and operate the trap. Walla Walla Corps said it was possible; only concern is water level dropping and not being stable through ladder and/or trap. They project may be short staffed over the weekend so it is risky to manipulate at multiple places at the project. That said, Ann thought it would be possible.

TMT explored the option of switching to Unit 1 as priority unit for the rest of today and through weekend while trying to collect and transport sockeye. Though not desirable, the current situation for the adults was critical and Unit 1 priority seemed to provide improved ladder temperature and increased adult passage yesterday. NOAA and Idaho supported this option. Washington did not object; Nez Perce also did not object given the current circumstances; Montana said it was a reasonable proposal; BPA supported it; and Oregon did not object though expressed concern for spill being reduced for juveniles. Erick Van Dyke, Oregon, said he recognizes the potential for this operation supporting adult fish passage in great need and that a lot has been done to find solutions. He and Charles Morrill, Washington, emphasized the need to see all data continue to be collected and inform our decisions – and that data right now is ‘coarse’.

Action: The Corps will implement the operation as described above starting today and through the weekend. They will run Unit 1 priority until Monday morning, at which time TMT will reconvene for a conference call at 10:00 am. Updated data for Monday’s review includes: passage counts and temperatures; and specifics on the modifications and operations that occurred real time throughout this period.

Columbia River Regional Forum

TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

July 26, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference calls were chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, Idaho, Montana, Washington, Oregon, NOAA, the Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lower Granite Dam Operations for Adult Ladder Temperature Issues

Baus and Russ Kiefer, Idaho, led today's TMT discussion of ongoing fish ladder issues at Lower Granite Dam. The purpose of the call was to review all available data to date resulting from the operation coordinated at TMT on July 23 and tested for 48 hours, then devise a plan for weekend operations.

Darren Ogden, Lower Granite Dam, gave the latest temperature and passage data, which are posted to this item on today's agenda. As of this morning, 26 Chinook and 2 steelhead were in the adult trap. At 6 am the water level was down 4 inches; by 7 am it was down 8 inches. There is no longer enough water at the false weir to keep the trap operating.

Ann Setter, COE Walla Walla, gave an overview of project operations. It appears that operating two additional auxiliary pumps may entrain air into the water, so there's insufficient pressurized water to operate the trap. The COE has shut down auxiliary pump #2 to allow diffuser 14 to automatically adjust to the correct water level. The COE have added temperature gages in the junction pool at the lower end of the ladder and just above the count station window. Staff will continue to work on ways to minimize ladder temperatures while taking advantage of the fact that auxiliary pump #1 is still operating.

Charles Morrill, Washington, asked whether auxiliary pump #2 can be turned back on. The plan is to verify first that pump #2 is the source of the problem of unstable water levels at the trap, Greg Moody, COE Walla Walla, replied. Morrill and Kiefer both thanked the Action Agencies for their assiduous efforts to address the situation at Lower Granite. Kiefer said IDFG plans to trap sockeye tonight and haul them upstream tomorrow morning. He advocated shutting off the emergency valves because it reduces the cool water added to the ladder. A temporary solution might be to run auxiliary pump #2 during the day to keep the ladder cool and fish moving, turning it off at night when temperatures fall.

Greg Moody, COE Walla Walla, reported on passage numbers with the operation underway. There were 2 sockeye going upstream and 1 Chinook this morning. It appears that adults are falling back the ladder in front of the count station window more today than yesterday.

Setter reported that yesterday, when unit 1 was turned off at 6 pm and the regular FOP operation resumed (unit 2), there appeared to have been a change in passage behavior. The COE intends to keep on working to find a stable water supply so the water level in the trap doesn't drop to the point where air is entrained in Diffuser #14. During the day when peak passage occurred, auxiliary pump #2 was also operating. Also, yesterday about 4:15 pm staff noticed an accumulation of adults in the control section of the ladder near the exit. This morning they were no longer there. When Unit 1 cycled off at 6 pm, by 7 pm ladder counts had dropped off and haven't risen since.

Setter said today's experience at the adult trap clarified that auxiliary pump #2 can't be left on automatic overnight, and Diffuser #14 should be manually adjusted. There is a strong possibility the weekend operator will be able to implement Idaho's and NOAA's proposal.

Given what happened after the project reverted to normal FOP spill operations, Paul Wagner, **NOAA**, advocated switching back to unit 1 priority over the weekend. Russ Kiefer, **Idaho**, agreed and proposed the COE set up the best possible operation for adult passage at Lower Granite in terms of implementing unit 1 priority at current flows. Dave Statler, **Nez Perce Tribe**, asked how many of the three auxiliary pumps are currently operating. Pump #2 went offline at 12:55 pm today, Setter said. Because weekend staffing at the dam is minimal, it's not possible to operate more pumps manually over the weekend.

Idaho and **NOAA** recommended operation of unit 1 as the priority unit for the rest of today and through the weekend. TMT members gave their views of this proposal:

- **Nez Perce** – No objection.
- **Montana** – Supports the proposal.
- **BPA** – Supports the proposal.
- **Oregon** – Somewhat reluctant to compromise spill measures in place for juveniles. In light of how much effort has gone into addressing ladder temperatures, does not object to unit #1 priority and reducing spill below what's in the current FOP. It's difficult to make an informed decision on this, given the lack of data available to analyze actual impacts of the operation.

- **Washington** – Does not object to unit 1 priority. Keeping temperatures down in the adult ladder is key. Agrees with Oregon that lack of data is making it difficult to determine whether the operation has made a difference.

Idaho and NOAA expressed appreciation for Oregon's willingness to alter the FOP operation in light of the problems facing adults. Discussion turned to the need for a more informed discussion Monday. The COE will overlay information so TMT will be in a good position to correlate adult count and temperature data with operational modifications. Updated data regarding hourly operations, adult passage counts and ladder temperatures will be available to TMT for a Monday 10 am call regarding Lower Granite operations. Next steps will be determined at that time.

3. Lower Granite Dam Adult Sockeye Transportation – Russ Keifer, Idaho reported adult sockeye transport would not begin today as previously planned because the adult trap was inoperable at this time. It appears hydraulic effects associated with adding water from the auxiliary pumps to cool the fishway is rendering the adult trap inoperable. NOAA, IDFG, and Corps staff will continue to troubleshoot this issue and determine if any adjustments could be made in order to operate the adult trap and transport adult sockeye.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Tony Norris	BPA
Russ Kiefer	Idaho
Margaret Filardo	FPC
Dave Benner	FPC
Brandon Chockley	FPC
Lisa Wright	COE
Barry Espenson	CBB
Jim Litchfield	Montana
Scott Bettin	BPA
Darren Ogden	NOAA Fisheries
Matt Corsi	IDFG
Charles Morrill	Washington
Paul Wagner	NOAA
Erick Van Dyke	Oregon
Ann Setter	COE Walla Walla
Greg Moody	COE Walla Walla
Ryan Laughery	COE Walla Walla
Chris Pinney	COE Walla Walla
Brad Trumbo	COE Walla Walla
Dave Statler	Nez Perce Tribe

TECHNICAL MANAGEMENT TEAM

NOAA:	<i>Paul Wagner / Richard Dominique</i>	USFWS:	<i>David Wills / Steve Haeseker</i>
OR:	<i>Erick Van Dyke</i>	ID:	<i>Russ Kiefer / Pete Hassemer</i>
WA:	<i>Charles Morrill</i>	MT:	<i>Jim Litchfield / Brian Marotz</i>
Kootenai:	<i>Sue Ireland / Billy Barquin</i>	Spokane:	<i>Andy Miller</i>
Colville:	<i>Sheri Sears / Keith Wolf</i>	Nez Perce:	<i>Dave Statler</i>
Umatilla:	<i>Tom Lorz (CRITFC)</i>	Salish-Kootenai	<i>Stu Levit</i>
BPA:	<i>Tony Norris / Scott Bettin / Robyn MacKay</i>	BOR:	<i>John Roache / Mary Mellema / Pat McGrane</i>
COE:	<i>Doug Baus / Karl Kanbergs</i>		

TMT CONFERENCE CALL

Monday, July 29, 2013 10:00am - 11:00am

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 7877

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**We have had disruptions when people do not mute their phones.
Please MUTE your phone.**

*All members are encouraged to contact Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Lower Granite Dam Operations for Adult Ladder Temperature Issues - Ann Setter, COE NWW / Russ Kiefer, Idaho
 - a. [SOR 2013-4](#)
 - b. [Hourly Project Data and Operations, July 23-29](#)
 - c. [*TO BE UPDATED* Adult Passage Count Data, July 23-29](#)
 - d. [*TO BE UPDATED* Ladder Temperature Data, July 23-29](#)
 - e. [Ladder Temperature Hourly Hobo Data](#)
3. Lower Granite Dam Adult Sockeye Transportation - Russ Kiefer, Idaho
4. Other

- a. Set agenda and date for next meeting - **July 31, 2013**
- b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 22, 2013				
	GROSS GEN MW	STA USE MW	-----		OUTFLOW	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT STATUS		LWSI GAGE ELEV
			-- TOTAL	IN KCFS POWER	-- SPILL	IN FEET + MSL FOREBAY TAILWATR	ON RMT			ON LINE	AVL	
1		1	25.50	11.80	13.40	735.42	633.09	102.33				735.46
2		1	27.20	11.80	13.50	735.45	633.29	102.16				735.46
3		1	25.60	11.80	13.50	735.46	633.07	102.39				735.46
4		2	25.70	11.90	13.50	735.47	633.03	102.44				735.46
5		1	25.70	11.90	13.50	735.48	633.09	102.39				735.46
6		1	25.80	12.00	13.60	735.54	633.05	102.49				735.46
7		1	25.80	11.90	13.60	735.58	632.97	102.61				735.46
8		1	30.70	12.00	18.30	735.50	633.50	102.00				735.46
9		1	30.70	12.00	18.50	735.51	633.36	102.15				735.46
10		1	30.60	11.90	18.50	735.48	633.44	102.04				735.46
11		1	30.80	12.00	18.50	735.43	633.50	101.93				735.46
12		1	30.80	12.00	18.50	735.43	633.47	101.96				735.52
13		1	28.70	11.90	16.50	735.42	633.25	102.17				735.52
14		1	28.60	11.80	16.50	735.36	633.26	102.10				735.52
15		2	28.50	11.80	16.50	735.36	633.22	102.14				735.52
16		2	28.60	11.80	16.50	735.39	633.29	102.10				735.52
17		2	25.80	15.00	10.50	735.40	633.34	102.06				735.52
18		1	24.00	16.80	6.90	735.40	633.32	102.08				735.51
19		1	24.00	16.90	6.90	735.45	633.38	102.07				735.51
20		1	24.10	16.90	6.90	735.47	633.25	102.22				735.51
21		1	24.10	16.90	6.90	735.52	633.27	102.25				735.51
22		1	25.80	16.90	6.90	735.55	633.48	102.07				735.51
23		1	24.00	16.90	6.90	735.59	633.26	102.33				735.51
24		1	24.00	16.90	6.90	735.60	633.21	102.39				735.51
TOT		35										
AVG		1	26.88	13.48	12.99	735.47	633.27	102.20				735.49
MAX			30.80	16.90	18.50	735.60	633.50	102.61				735.52
MIN			24.00	11.80	6.90	735.36	632.97	101.93				735.46

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Tuesday July 23, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.70	16.80	6.90	735.63	633.56	102.07				735.51
2		1	24.00	16.80	6.90	735.65	633.20	102.45				735.51
3		1	24.20	16.90	7.10	735.66	633.27	102.39				735.51
4		1	27.30	16.90	10.10	735.67	633.24	102.43				735.51
5		1	27.50	17.00	10.20	735.71	632.92	102.79				735.51
6		1	27.50	16.90	10.30	735.72	633.16	102.56				735.51
7		1	27.40	16.90	10.30	735.75	633.11	102.64				735.51
8		1	27.90	17.30	10.40	735.72	633.00	102.72				735.51
9		2	27.30	11.90	15.10	735.77	633.09	102.68				735.74
10		1	27.20	11.80	15.10	735.78	633.07	102.71				735.74
11		1	27.20	11.80	15.10	735.76	633.10	102.66				735.74
12		1	27.00	11.60	15.10	735.77	633.12	102.65				735.74
13		1	27.20	11.70	15.20	735.72	633.08	102.64				735.74
14		2	26.90	11.60	15.10	735.75	633.10	102.65				735.74
15		2	27.10	11.70	15.00	735.71	633.15	102.56				735.74
16		2	28.70	11.60	15.10	735.70	633.26	102.44				735.74
17		2	27.20	11.70	15.10	735.72	633.07	102.65				735.74
18		1	27.10	11.70	15.20	735.74	633.10	102.64				735.74
19		1	26.70	11.20	15.20	735.71	633.12	102.59				735.74
20		1	30.30	5.00	25.00	735.65	633.13	102.52				735.74
21		1	30.60	5.00	25.30	735.62	633.12	102.50				735.74
22		1	30.40	5.00	25.10	735.57	633.11	102.46				735.74
23		1	30.30	5.00	25.00	735.54	633.23	102.31				735.74
24		1	28.20	5.00	22.90	735.54	633.30	102.24				735.74
TOT		35										
AVG		1	27.54	12.03	15.07	735.69	633.15	102.54				735.66
MAX			30.60	17.30	25.30	735.78	633.56	102.79				735.74
MIN			24.00	5.00	6.90	735.54	632.92	102.07				735.51

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM		Wednesday July 24, 2013			
	GROSS GEN MW	STA USE MW	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS		LWSI GAGE ELEV
			-- TOTAL	IN KCFS POWER	-- SPILL	IN FEET + MSL FOREBAY TAILWATR	ON LINE				AVL		
	1	1	28.20	5.00	22.90	735.52	633.33	102.19					735.74
	2	1	28.00	5.00	22.70	735.52	633.35	102.17					735.74
	3	1	27.90	5.00	22.60	735.53	633.37	102.16					735.74
	4	1	28.00	5.00	22.70	735.52	633.43	102.09					735.74
	5	1	28.10	5.00	22.80	735.52	633.37	102.15					735.74
	6	1	29.60	7.00	22.30	735.51	633.43	102.08					735.74
	7	1	26.90	16.90	9.60	735.56	633.52	102.04					735.74
	8	1	27.20	17.00	10.00	735.54	633.43	102.11					735.74
	9	1	27.40	17.10	10.00	735.56	633.61	101.95					735.74
	10	1	27.40	17.10	10.00	735.58	633.48	102.10					735.74
	11	1	27.40	17.10	10.00	735.56	633.24	102.32					735.74
	12	1	27.30	17.10	9.90	735.56	633.38	102.18					735.74
	13	1	29.00	17.10	9.90	735.58	633.36	102.22					735.74
	14	1	27.10	17.00	9.80	735.54	633.09	102.45					735.74
	15	2	27.20	17.10	9.90	735.54	633.21	102.33					735.74
	16	1	27.30	17.00	10.00	735.57	633.20	102.37					735.74
	17	1	27.30	17.00	10.00	735.59	633.25	102.34					735.74
	18	1	26.90	16.40	10.20	735.58	633.17	102.41					735.74
	19	1	28.70	5.00	23.40	735.56	633.19	102.37					735.74
	20	1	28.70	5.00	23.40	735.54	633.22	102.32					735.74
	21	1	28.70	5.00	23.40	735.52	633.29	102.23					735.74
	22	2	28.70	5.00	23.40	735.50	633.26	102.24					735.74
	23	1	28.70	5.00	23.40	735.47	633.32	102.15					735.74
	24	1	28.70	5.00	23.40	735.48	633.39	102.09					735.74
TOT		35											
AVG		1	27.93	11.08	16.49	735.54	633.33	102.21					735.74
MAX			29.60	17.10	23.40	735.59	633.61	102.45					735.74
MIN			26.90	5.00	9.60	735.47	633.09	101.95					735.74

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Thursday July 25, 2013					
	GROSS	STA	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG	SUPR	UNIT	STATUS	LWSI	
	GEN MW	USE MW	-- TOTAL	IN KCFS POWER	-- SPILL	IN FEET FOREBAY	+ MSL TAILWATR	HEAD FT	CAP MW	ON RMT	ON LINE		AVL
1		1	28.60	5.00	23.30	735.46	633.32	102.14					735.74
2		1	28.50	5.00	23.20	735.44	633.37	102.07					735.74
3		1	28.50	5.00	23.20	735.43	633.31	102.12					735.74
4		1	28.50	5.00	23.20	735.42	633.38	102.04					735.74
5		1	26.40	5.00	21.10	735.41	633.31	102.10					735.74
6		1	26.60	5.00	21.30	735.37	633.40	101.97					735.74
7		1	27.50	16.60	10.60	735.39	633.50	101.89					735.74
8		2	27.60	17.10	10.20	735.38	633.48	101.90					735.74
9		2	27.60	17.10	10.10	735.37	633.57	101.80					735.74
10		2	29.20	17.00	10.10	735.35	633.21	102.14					735.74
11		2	28.60	18.20	10.10	735.34	633.47	101.87					735.74
12		2	27.30	17.00	10.00	735.35	633.49	101.86					735.74
13		2	27.30	17.00	10.00	735.29	633.24	102.05					735.74
14		2	27.30	17.00	10.00	735.28	633.43	101.85					735.74
15		2	33.60	23.40	9.90	735.24	633.73	101.51					735.74
16		2	27.20	17.00	9.90	735.23	633.30	101.93					735.74
17		2	27.30	17.20	9.90	735.21	633.35	101.86					735.49
18		2	27.70	17.50	9.90	735.05	633.29	101.76					735.49
19		2	22.40	12.20	9.90	735.21	633.13	102.08					735.49
20		2	22.20	11.90	9.90	735.22	633.40	101.82					735.49
21		2	22.30	12.00	9.90	735.22	633.15	102.07					735.49
22		2	22.20	12.00	10.00	735.30	633.00	102.30					735.49
23		2	23.30	11.90	11.10	735.28	633.12	102.16					735.49
24		2	25.40	11.90	13.20	735.28	632.81	102.47					735.49
TOT		37											
AVG		2	26.80	13.08	13.33	735.31	633.32	101.99					735.66
MAX			33.60	23.40	23.30	735.46	633.73	102.47					735.74
MIN			22.20	5.00	9.90	735.05	632.81	101.51					735.49

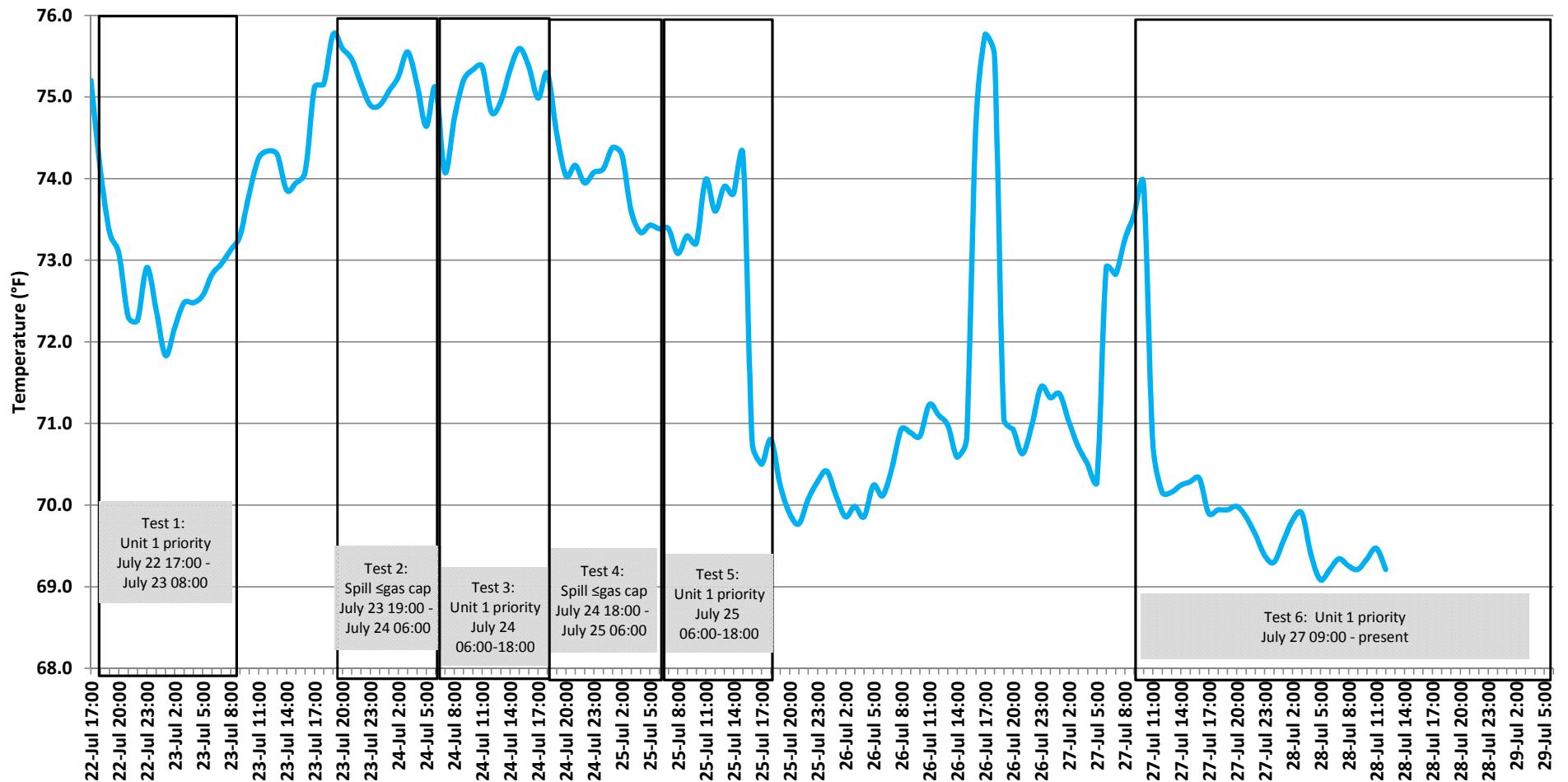
1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Friday July 26, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.30	11.90	13.10	735.32	632.72	102.60				735.49
2		2	25.40	12.00	13.10	735.31	632.99	102.32				735.49
3		2	27.00	11.90	13.10	735.26	632.89	102.37				735.49
4		2	25.30	11.80	13.20	735.30	632.60	102.70				735.49
5		2	25.60	11.90	13.30	735.33	632.84	102.49				735.49
6		2	25.50	11.80	13.40	735.38	632.74	102.64				735.49
7		2	29.60	11.90	17.30	735.35	633.16	102.19				735.49
8		2	30.70	12.10	18.30	735.39	633.24	102.15				735.49
9		2	30.60	11.90	18.30	735.40	633.11	102.29				735.49
10		2	30.60	12.00	18.30	735.35	633.30	102.05				735.49
11		2	30.50	11.90	18.30	735.35	633.28	102.07				735.49
12		2	30.40	11.90	18.20	735.35	633.29	102.06				735.49
13		2	30.50	12.00	18.20	735.28	633.46	101.82				735.49
14		2	30.60	12.00	18.30	735.28	633.44	101.84				735.49
15		2	30.50	12.00	18.20	735.24	633.44	101.80				735.49
16		2	30.50	12.10	16.50	735.24	633.07	102.17				735.49
17		1	23.60	12.00	11.30	735.24	633.24	102.00				735.49
18		1	23.50	11.90	11.30	735.22	633.39	101.83				735.49
19		2	23.60	12.00	11.30	735.25	633.07	102.18				735.49
20		2	23.60	12.00	11.30	735.28	633.22	102.06				735.49
21		2	23.60	12.00	11.30	735.25	633.35	101.90				735.49
22		2	23.70	12.10	11.20	735.29	633.15	102.14				735.49
23		2	23.50	11.90	11.20	735.33	633.16	102.17				735.49
24		2	23.40	11.90	11.20	735.34	633.37	101.97				735.49
TOT		38										
AVG		2	26.96	11.95	14.55	735.31	633.15	102.16				735.49
MAX			30.70	12.10	18.30	735.40	633.46	102.70				735.49
MIN			23.40	11.80	11.20	735.22	632.60	101.80				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Saturday July 27, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	23.30	12.00	11.00	735.32	633.26	102.06				735.49
2		2	23.40	11.90	11.20	735.35	633.24	102.11				735.49
3		2	23.50	12.00	11.20	735.35	633.40	101.95				735.49
4		2	23.60	12.10	11.20	735.37	633.33	102.04				735.49
5		2	23.50	12.00	11.20	735.42	633.27	102.15				735.49
6		2	23.50	11.90	11.20	735.46	633.37	102.09				735.49
7		1	23.50	11.90	11.30	735.50	633.36	102.14				735.49
8		1	23.60	11.90	11.30	735.56	633.32	102.24				735.49
9		1	23.70	12.00	11.30	735.58	633.43	102.15				735.49
10		1	24.70	13.40	11.00	735.61	633.38	102.23				735.49
11		2	25.80	17.20	8.30	735.57	633.50	102.07				735.49
12		2	27.50	17.20	8.30	735.61	633.72	101.89				735.49
13		2	25.80	17.20	8.30	735.56	633.50	102.06				735.49
14		2	25.80	17.20	8.30	735.56	633.52	102.04				735.49
15		2	25.80	17.30	8.20	735.57	633.81	101.76				735.49
16		2	27.50	17.20	8.20	735.56	633.64	101.92				735.49
17		2	25.70	17.20	8.30	735.57	633.53	102.04				735.49
18		2	25.70	17.20	8.30	735.56	633.63	101.93				735.49
19		2	25.80	17.20	8.30	735.54	633.40	102.14				735.49
20		2	25.60	17.10	8.20	735.52	633.35	102.17				735.49
21		2	25.50	17.10	8.10	735.50	633.56	101.94				735.49
22		2	25.40	17.10	8.00	735.49	633.44	102.05				735.49
23		2	25.50	17.10	8.10	735.46	633.50	101.96				735.49
24		2	25.60	17.10	8.10	735.43	633.57	101.86				735.49
TOT		38										
AVG		2	24.97	15.06	9.45	735.50	633.46	102.04				735.49
MAX			27.50	17.30	11.30	735.61	633.81	102.24				735.49
MIN			23.30	11.90	8.00	735.32	633.24	101.76				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Sunday July 28, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.60	17.20	8.10	735.42	633.53	101.89				735.49
2		2	25.70	17.20	8.20	735.39	633.48	101.91				735.49
3		2	25.80	17.20	8.30	735.35	633.60	101.75				735.49
4		2	25.70	17.10	8.30	735.37	633.50	101.87				735.49
5		2	25.60	17.20	8.10	735.37	633.50	101.87				735.49
6		2	25.60	17.20	8.20	735.35	633.55	101.80				735.49
7		2	25.60	17.10	8.20	735.37	633.41	101.96				735.50
8		2	25.50	17.10	8.20	735.39	633.58	101.81				735.50
9		2	25.50	17.10	8.10	735.39	633.49	101.90				735.50
10		2	25.50	17.10	8.10	735.39	633.59	101.80				735.50
11		2	25.60	17.20	8.10	735.39	633.56	101.83				735.50
12		2	25.50	17.00	8.10	735.39	633.57	101.82				735.50
13		2	27.00	16.90	8.10	735.37	633.53	101.84				735.50
14		2	25.40	17.00	8.10	735.32	633.39	101.93				735.50
15		2	25.40	17.00	8.10	735.32	633.30	102.02				735.50
16		2	25.40	16.90	8.10	735.33	633.47	101.86				735.50
17		2	25.30	16.90	8.10	735.35	633.41	101.94				735.50
18		2	25.40	17.00	8.10	735.32	633.46	101.86				735.50
19		2	25.30	17.00	8.00	735.29	633.48	101.81				735.50
20		2	25.30	17.00	8.00	735.27	633.49	101.78				735.50
21		2	25.20	17.00	8.00	735.24	633.44	101.80				735.50
22		2	25.40	17.10	7.90	735.21	633.50	101.71				735.50
23		2	25.40	17.10	7.90	735.20	633.43	101.77				735.50
24		2	25.30	17.00	8.00	735.18	633.40	101.78				735.50
TOT		38										
AVG		2	25.54	17.07	8.10	735.33	633.49	101.85				735.50
MAX			27.00	17.20	8.30	735.42	633.60	102.02				735.50
MIN			25.20	16.90	7.90	735.18	633.30	101.71				735.49

1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM		Monday July 29, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.40	17.00	8.00	735.15	633.46	101.69					735.50
2		2	25.50	17.10	8.10	735.10	633.36	101.74					735.50
3		2	24.90	17.00	7.60	735.10	633.41	101.69					735.50
4		2	24.20	17.10	6.80	735.08	633.50	101.58					735.50
5		2	24.30	17.20	6.80	735.07	633.43	101.64					735.50
6		2	24.30	17.10	6.80	735.08	633.43	101.65					735.48
7		2	24.30	17.20	6.80	735.11	633.44	101.67					735.48
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
TOT		11											
AVG		2	24.70	17.10	7.27	735.10	633.43	101.67					735.49
MAX			25.50	17.20	8.10	735.15	633.50	101.74					735.50
MIN			24.20	17.00	6.80	735.07	633.36	101.58					735.48

LWG Adult Ladder Exit Temp (°F)



Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

Monday, July 29, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference call was chaired and facilitated by Lisa Wright and Bill Proctor, COE. Representatives of the COE, Washington, BPA, USFWS, Idaho, NOAA, Oregon, Idaho, Montana, the Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lower Granite Dam Operations for Adult Ladder Temperature Issues

The purpose of today's TMT call was to use available adult passage data to correlate the Lower Granite special operation (Unit 1 priority) implemented over the weekend with resulting ladder temperature and fish counts and decide on next steps at Lower Granite.

Greg Moody, COE Walla Walla, gave an update on fish passage counts for the weekend relative to the LWG unit 1 priority operation that was coordinated during the July 26 TMT meeting. On July 27, 19 adult sockeye passed Lower Granite moving upstream, and on July 28, 32 sockeye passed moving upstream. No sockeye have passed the dam yet today. Night counts were zero on July 26-27, so it appears the unit 1 priority did not improve nighttime fish passage.

As of noon today, there may not be enough water in the river to operate Unit 1 and the RSW, Ann Setter, COE Walla Walla, reported. The RSW will need to be closed if Unit 1 operation is to continue. Considering that Unit 1 can only pass 17 kcfs and the RSW passes an additional 7 kcfs, inflows of less than 23-24 kcfs mean there isn't enough water in the river to operate both Unit 1 and the RSW, Wright said.

Russ Kiefer, Idaho, reported there has been a reduction in the ladder temperature. There have been positive sockeye counts but they're not great. Chinook and steelhead have been moving as well. Attempts to trap and haul were suspended by agreement with COE and project staff, while turbine 1 operations continued as well as the effort to keep the ladders as cool as possible.

Setter mentioned that Unit 3 is down for maintenance, which will affect the unit sequence if FOP operations resume. Operating the unit closer to the ladder seems to result in higher passage numbers, but it is not known what effect the RSW has on ladder temperatures. Setter asked, if the RSW hadn't been running all weekend, would the operation have been just as effective using Unit 2 as it was using Unit 1?

Unless there is compelling evidence to the contrary, **Idaho** proposes returning to the FPP unit priority operation with Unit 2 as first priority, which would also provide approximately 5-6 kcfs more spill for juveniles, Kiefer said. Charles Morrill, **Washington**, said FPAC is still looking at available information on this. While it is clear that introducing cool water into the ladder made a huge difference in fish movement, it's still not clear how much impact Unit 1 operations actually had on that.

Ladder temperatures increased substantially when the pumps were shut off in order to get water into the trap, Margaret Filardo, FPC, observed. There were temperature spikes when the units came on while Unit 1 priority was in effect. Over the long term, Setter said, greater ability to regulate Diffuser #14 will be essential to the success of this operation.

TMT members gave their views of the Idaho proposal to revert to Unit 2 priority operations at Lower Granite and pass peak flows through the RSW to the spill cap:

- **NOAA** – No objection
- **Oregon** – No objection
- **Washington** – No objection
- **BPA** – Supports the proposal
- **COE** – Supports the proposal
- **USFWS** – Supports the proposal
- **Nez Perce** – Supports the proposal
- **Montana** – Supports the proposal

With consensus on this operation, the COE will implement it and TMT will revisit Lower Granite operations in a conference call July 31.

<i>Name</i>	<i>Affiliation</i>
Lisa Wright	COE
Charles Morrill	Washington
Scott Bettin	BPA
David Wills	USFWS
Russ Kiefer	Idaho
Paul Wagner	NOAA
Erick Van Dyke	Oregon
Bill Proctor	COE
Karl Kanbergs	COE
Dan Feil	COE
Darren Ogden	NOAA (Lower Granite adult study)
Dan Baker	IDFG
Mike Peterson	IDFG
Ann Setter	COE Walla Walla

Greg Moody
Margaret Filardo
Dave Benner
Dave Statler
Jim Litchfield

COE Walla Walla
FPC
FPC
Nez Perce
Montana

TECHNICAL MANAGEMENT TEAM

NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)	Salish-Kootenai:	Stu Levit
BPA:	Tony Norris / Scott Bettin / Robyn MacKay	BOR:	John Roache / Mary Mellema / Pat McGrane
COE:	Doug Baus / Karl Kanbergs		

TMT CONFERENCE CALL

July 31, 2013 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 0132

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**We have had disruptions when people do not mute their phones.
Please MUTE your phone.**

*All members are encouraged to contact Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Lower Granite Dam Operations for Adult Ladder Temperature Issues - Doug Baus, COE NWD / Russ Kiefer, Idaho
 - a. updated Thurs, Aug 1 at 13:45 - LWG Adult Passage Counts and Ladder Temperature Hourly Data. [\[PDF\]](#) [\[Excel\]](#)
 - b. updated Thurs, Aug 1 at 10:00 - [LWG Adult Ladder Exit Temperature Graph.](#)
 - c. [Dworshak Water Temperature Comparison Plot](#)
3. Lower Granite Dam Adult Sockeye Transportation - Russ Kiefer, Idaho
4. Other
 - a. Set agenda and date for next meeting - **August 7, 2013**

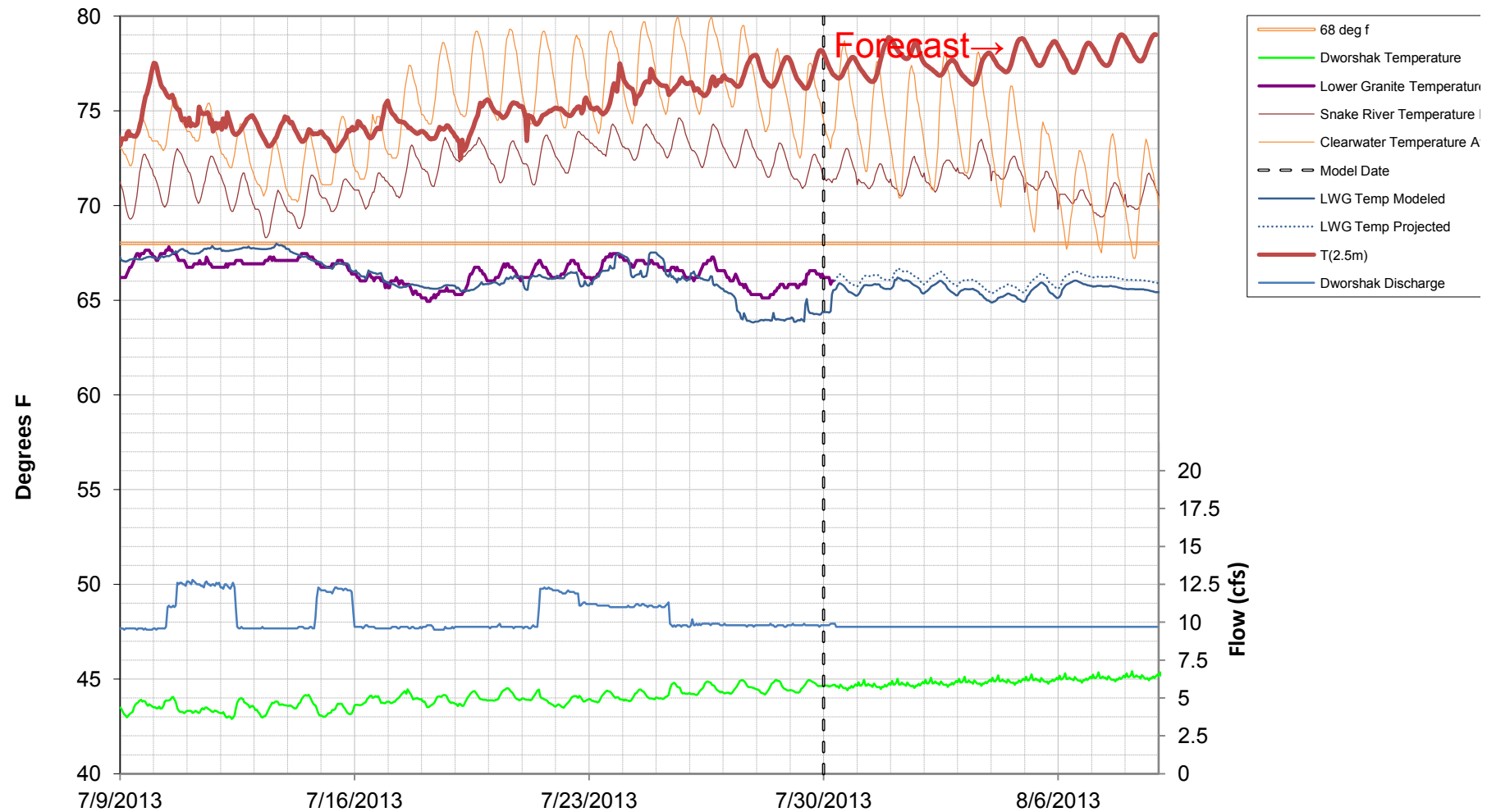
b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

Analog Year 2007
DWR@9.7kcfs

Water Temperature Comparisons Model from 7/9/2013 to 8/9/2013 Observed Data to 7/30/2013



Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Unit 1 (~17k) + spill	Tue 23-Jul	Day	5:00	72.6	6:00	8	0	6	0	0	0	0	0	0	0
	Tue 23-Jul	Day	6:00	72.8	7:00	20	17	12	9	1	1	1	0	0	0
	Tue 23-Jul	Day	7:00	73.0	8:00	29	24	33	14	7	1	3	1	1	0
0800-1900: FOP Unit 2 + spill (min gen)	Tue 23-Jul	Day	8:00	73.1	9:00	17	20	23	28	2	1	1	0	0	0
	Tue 23-Jul	Day	9:00	73.3	10:00	4	5	1	7	1	3	1	1	0	0
	Tue 23-Jul	Day	10:00	73.8	11:00	7	14	2	0	2	0	1	1	0	0
	Tue 23-Jul	Day	11:00	74.3	12:00	2	5	0	0	0	1	0	0	0	1
	Tue 23-Jul	Day	12:00	74.3	13:00	5	5	0	2	6	2	2	0	1	0
	Tue 23-Jul				Day Sum 1	2		17		10		6		1	
	Tue 23-Jul	Day	13:00	74.3	14:00										
	Tue 23-Jul	Day	14:00	73.9	15:00										
	Tue 23-Jul	Day	15:00	73.9	16:00										
	Tue 23-Jul	Day	16:00	74.1	17:00										
	Tue 23-Jul	Day	17:00	75.1	18:00										
	Tue 23-Jul	Day	18:00	75.2	19:00										
Unit 5 (5k) + Spill ≤TDG cap (25k)	Tue 23-Jul	Day	19:00	75.8	20:00										
	Tue 23-Jul	Day	20:00	75.6	21:00										
	Tue 23-Jul				Day Sum 2	n/a		n/a		n/a		n/a		n/a	
	Tue 23-Jul				Day Total (FPC)	0		22		19		7		2	
	Tue 23-Jul	Night video	21:00	75.5	22:00	0	1	0	0	0	0	0	0	0	0
	Tue 23-Jul	Night video	22:00	75.2	23:00	0	0	0	0	0	0	0	0	0	0
	Tue 23-Jul	Night video	23:00	74.9	0:00	0	0	0	0	0	0	0	0	0	0
	Wed 24-Jul	Night video	0:00	74.9	1:00	0	0	0	0	0	0	1	0	0	0
	Wed 24-Jul	Night video	1:00	75.1	2:00	0	0	0	0	0	0	0	0	0	0
	Wed 24-Jul	Night video	2:00	75.2	3:00	0	1	0	0	0	0	0	0	0	0
	Wed 24-Jul	Night video	3:00	75.6	4:00	0	0	1	1	0	0	0	0	0	0
	Wed 24-Jul	Night video	4:00	75.2	5:00	0	0	1	0	0	0	0	0	0	0
	Tue 23-Jul / Wed 24-Jul				Night Sum	-2		1		0		1		0	

Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
0600-1800: Unit 1 (~17k) + spill	Wed 24-Jul	Day	5:00	74.6	6:00	2	2	1	2	0	0	0	0	0	0
	Wed 24-Jul	Day	6:00	75.1	7:00	1	0	1	0	1	0	3	0	0	0
	Wed 24-Jul	Day	7:00	74.1	8:00	2	0	2	1	2	0	2	1	0	0
	Wed 24-Jul	Day	8:00	74.7	9:00	6	6	5	4	2	0	0	2	0	0
	Wed 24-Jul	Day	9:00	75.2	10:00	7	10	9	4	2	4	2	2	0	1
	Wed 24-Jul	Day	10:00	75.3	11:00	2	1	2	2	2	1	0	0	0	0
	Wed 24-Jul	Day	11:00	75.4	12:00	19	10	8	8	0	0	2	0	0	0
	Wed 24-Jul	Day	12:00	74.8	13:00	3	5	0	0	1	2	1	0	0	0
	Wed 24-Jul				Day Sum 1	8		7		3		5		-1	
	Wed 24-Jul	Day	13:00	74.9	14:00										
	Wed 24-Jul	Day	14:00	75.3	15:00										
	Wed 24-Jul	Day	15:00	75.6	16:00										
	Wed 24-Jul	Day	16:00	75.4	17:00										
	Wed 24-Jul	Day	17:00	75.0	18:00										
1800-0600: Unit 5 (5k) + Spill ≤TDG cap (25k)	Wed 24-Jul	Day	18:00	75.3	19:00										
	Wed 24-Jul	Day	19:00	74.6	20:00										
	Wed 24-Jul	Day	20:00	74.0	21:00										
	Wed 24-Jul				Day Sum 2	n/a		n/a		n/a		n/a		n/a	
	Wed 24-Jul				Day Total (FPC)	11		14		17		10		2	
	Wed 24-Jul	Night video	21:00	74.2	22:00	0	0	0	0	0	0	0	0	0	1
	Wed 24-Jul	Night video	22:00	73.9	23:00	0	0	0	0	0	0	0	0	0	0
	Wed 24-Jul	Night video	23:00	74.1	0:00	0	0	0	0	0	0	0	0	0	0
	Thu 25-Jul	Night video	0:00	74.1	1:00	0	0	0	0	0	0	0	0	0	0
	Thu 25-Jul	Night video	1:00	74.4	2:00	0	0	1	0	0	0	0	0	0	0
	Thu 25-Jul	Night video	2:00	74.3	3:00	0	0	0	0	0	0	0	0	0	0
	Thu 25-Jul	Night video	3:00	73.6	4:00	0	0	0	0	0	0	0	0	0	0
	Thu 25-Jul	Night video	4:00	73.3	5:00	0	0	0	0	0	0	1	1	0	0
	Wed 24-Jul / Thu 25-Jul				Night Sum	0		1		0		0		-1	

Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
0600-1800: Unit 1 (~17k) + spill. Emergency auxiliary pumps installed Thu 7/25 at 0715.	Thu 25-Jul	Day	5:00	73.4	6:00	1	0	0	0	0	0	4	1	0	0
	Thu 25-Jul	Day	6:00	73.4	7:00	0	1	0	0	1	0	4	3	0	0
	Thu 25-Jul	Day	7:00	73.4	8:00	8	2	5	1	5	0	4	0	0	0
	Thu 25-Jul	Day	8:00	73.1	9:00	19	14	18	5	4	1	2	0	2	0
	Thu 25-Jul	Day	9:00	73.3	10:00	24	9	14	5	6	0	4	1	2	0
	Thu 25-Jul	Day	10:00	73.2	11:00	17	6	16	3	1	0	2	0	2	0
	Thu 25-Jul	Day	11:00	74.0	12:00	28	14	14	2	4	0	9	3	4	0
	Thu 25-Jul	Day	12:00	73.6	13:00	22	11	15	6	2	1	3	0	1	0
	Thu 25-Jul				Day Sum 1	62		60		21		24		11	
	Thu 25-Jul	Day	13:00	73.9	14:00	13	8	8	4	1	0	2	1	2	1
	Thu 25-Jul	Day	14:00	73.8	15:00	26	12	18	6	3	5	7	4	1	1
	Thu 25-Jul	Day	15:00	74.3	16:00	19	10	12	2	5	2	3	0	0	1
	Thu 25-Jul	Day	16:00	70.8	17:00	45	5	25	0	1	0	8	1	5	0
	Thu 25-Jul	Day	17:00	70.5	18:00	20	1	22	1	8	2	4	0	4	0
FOP: Unit 2 + spill (min gen)	Thu 25-Jul	Day	18:00	70.8	19:00	17	1	7	0	2	0	3	0	4	1
	Thu 25-Jul	Day	19:00	70.2	20:00	1	1	2	0	2	1	0	0	1	1
	Thu 25-Jul	Day	20:00	69.9	21:00	5	0	1	0	1	0	0	0	0	1
	Thu 25-Jul				Day Sum 2	108		82		13		21		11	
	Thu 25-Jul				Day Total (FPC)	204		170		41		54		26	
	Thu 25-Jul	Night video	21:00	69.8	22:00	0	0	0	0	0	0	0	0	2	0
	Thu 25-Jul	Night video	22:00	70.1	23:00	1	0	0	0	0	0	0	0	0	0
	Thu 25-Jul	Night video	23:00	70.3	0:00	0	0	0	1	0	0	0	0	0	0
	Fri 26-Jul	Night video	0:00	70.4	1:00	0	0	0	0	0	0	0	0	0	0
	Fri 26-Jul	Night video	1:00	70.1	2:00	0	0	0	0	0	0	0	0	0	0
	Fri 26-Jul	Night video	2:00	69.9	3:00	0	0	0	0	0	0	0	0	0	0
	Fri 26-Jul	Night video	3:00	70.0	4:00	0	0	0	0	1	0	0	0	0	0
	Fri 26-Jul	Night video	4:00	69.9	5:00	1	1	0	0	0	0	0	0	0	0
	Thu 25-Jul / Fri 26-Jul				Night Sum	1		-1		1		0		2	

Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
	Fri 26-Jul	Day	5:00	70.2	6:00	0	0	7	0	0	0	0	0	0	0
	Fri 26-Jul	Day	6:00	70.1	7:00	11	0	4	0	0	0	1	0	2	1
	Fri 26-Jul	Day	7:00	70.5	8:00	10	6	7	3	2	0	2	0	0	1
	Fri 26-Jul	Day	8:00	70.9	9:00	6	14	4	16	0	0	2	2	0	0
	Fri 26-Jul	Day	9:00	70.9	10:00	7	10	4	10	4	3	4	2	0	1
	Fri 26-Jul	Day	10:00	70.8	11:00	8	14	5	9	2	3	1	0	0	0
	Fri 26-Jul	Day	11:00	71.2	12:00	14	13	6	9	2	1	0	0	2	1
	Fri 26-Jul	Day	12:00	71.1	13:00	5	7	3	7	2	0	1	0	1	1
	Fri 26-Jul				Day Sum 1	-3		-14		5		7		0	
	Fri 26-Jul	Day	13:00	71.0	14:00	1	6	1	4	2	1	1	0	0	1
	Fri 26-Jul	Day	14:00	70.6	15:00	1	9	1	3	0	0	2	0	0	2
	Fri 26-Jul	Day	15:00	70.8	16:00	4	2	0	2	0	0	2	0	2	2
	Fri 26-Jul	Day	16:00	74.6	17:00	1	9	1	1	0	0	4	3	0	1
	Fri 26-Jul	Day	17:00	75.8	18:00	0	4	1	1	0	0	1	2	0	0
	Fri 26-Jul	Day	18:00	75.5	19:00	0	0	0	0	0	0	1	0	0	0
	Fri 26-Jul	Day	19:00	71.1	20:00	1	1	4	1	0	0	1	0	0	0
	Fri 26-Jul	Day	20:00	70.9	21:00	1	0	2	0	1	0	1	0	1	0
	Fri 26-Jul				Day Sum 2	-22		-2		2		8		-3	
	Fri 26-Jul				Day Total (FPC)	-30		-19		8		18		-4	
	Fri 26-Jul	Night video	21:00	70.6	22:00	0	1	0	0	1	0	0	0	0	1
	Fri 26-Jul	Night video	22:00	71.0	23:00	0	0	0	1	0	0	0	0	1	0
	Fri 26-Jul	Night video	23:00	71.4	0:00	0	0	0	0	0	0	0	0	0	0
	Sat 27-Jul	Night video	0:00	71.3	1:00	1	0	0	0	0	0	0	0	0	0
	Sat 27-Jul	Night video	1:00	71.4	2:00	1	0	0	0	0	0	0	0	0	0
	Sat 27-Jul	Night video	2:00	71.0	3:00	1	1	0	0	0	0	0	0	0	0
	Sat 27-Jul	Night video	3:00	70.7	4:00	3	3	0	0	0	0	1	0	0	0
	Sat 27-Jul	Night video	4:00	70.5	5:00	0	0	0	1	0	0	1	0	0	0
	Fri 26-Jul / Sat 27-Jul				Night Sum	1		-2		1		2		0	

Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Unit 1 (~17k) + spill	Sat 27-Jul	Day	5:00	70.3	6:00	3	1	2	2	0	0	1	0	0	0
	Sat 27-Jul	Day	6:00	72.9	7:00	3	2	2	1	5	3	1	0	0	0
	Sat 27-Jul	Day	7:00	72.8	8:00	2	1	1	1	0	0	0	0	0	0
	Sat 27-Jul	Day	8:00	73.3	9:00	1	1	2	1	1	0	4	1	0	0
	Sat 27-Jul	Day	9:00	73.6	10:00	0	0	0	0	1	0	1	0	0	0
	Sat 27-Jul	Day	10:00	73.9	11:00	0	0	1	0	1	0	1	1	0	0
	Sat 27-Jul	Day	11:00	70.8	12:00	11	0	7	0	1	0	7	1	0	0
	Sat 27-Jul	Day	12:00	70.2	13:00	22	2	16	0	8	0	10	0	0	0
	Sat 27-Jul				Day Sum 1	35		26		14		22		0	
	Sat 27-Jul	Day	13:00	70.2	14:00	42	4	34	2	10	1	6	1	2	0
	Sat 27-Jul	Day	14:00	70.2	15:00	77	3	39	7	3	1	5	0	4	0
	Sat 27-Jul	Day	15:00	70.3	16:00	57	16	27	12	4	0	13	1	6	0
	Sat 27-Jul	Day	16:00	70.3	17:00	34	35	20	16	3	1	6	0	6	1
	Sat 27-Jul	Day	17:00	69.9	18:00	25	28	12	10	0	1	6	1	5	1
	Sat 27-Jul	Day	18:00	69.9	19:00	22	21	8	6	0	1	4	1	2	0
	Sat 27-Jul	Day	19:00	69.9	20:00	10	15	13	6	0	0	2	1	1	0
	Sat 27-Jul	Day	20:00	70.0	21:00	6	9	3	1	0	0	1	0	1	0
	Sat 27-Jul				Day Sum 2	142		96		15		38		25	
	Sat 27-Jul				Day Total (FPC)	212		146		35		72		30	
	Sat 27-Jul	Night video	21:00	69.9	22:00	0	1	0	1	0	0	0	0	0	0
	Sat 27-Jul	Night video	22:00	69.6	23:00	2	3	0	1	1	0	0	0	0	0
	Sat 27-Jul	Night video	23:00	69.4	0:00	1	0	0	0	0	0	0	0	0	0
	Sun 28-Jul	Night video	0:00	69.3	1:00	0	3	0	1	0	0	0	0	0	0
	Sun 28-Jul	Night video	1:00	69.6	2:00	1	4	2	4	0	0	0	0	0	0
	Sun 28-Jul	Night video	2:00	69.8	3:00	1	5	0	2	0	0	0	0	0	0
	Sun 28-Jul	Night video	3:00	69.9	4:00	0	6	1	4	0	0	0	0	0	0
	Sun 28-Jul	Night video	4:00	69.4	5:00	0	5	0	6	1	1	1	0	0	1
	Sat 27-Jul / Sun 28-Jul				Night Sum	-22		-16		1		1		-1	

Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
	Sun 28-Jul	Day	5:00	69.1	6:00	13	8	7	1	0	0	0	0	0	1
	Sun 28-Jul	Day	6:00	69.2	7:00	23	6	9	3	1	0	3	0	0	0
	Sun 28-Jul	Day	7:00	69.3	8:00	63	12	33	7	3	0	9	0	5	3
	Sun 28-Jul	Day	8:00	69.3	9:00	46	13	19	3	2	1	6	2	2	0
	Sun 28-Jul	Day	9:00	69.2	10:00	24	5	24	4	1	0	1	0	4	1
	Sun 28-Jul	Day	10:00	69.3	11:00	31	12	26	4	8	3	6	1	3	0
	Sun 28-Jul	Day	11:00	69.5	12:00	34	14	22	9	1	0	7	0	5	1
	Sun 28-Jul	Day	12:00	69.2	13:00	25	18	10	6	4	1	4	0	1	0
	Sun 28-Jul				Day Sum 1	171		113		15		33		14	
	Sun 28-Jul	Day	13:00		14:00	19	26	8	14	3	0	3	1	2	0
	Sun 28-Jul	Day	14:00		15:00	26	32	12	7	2	0	5	0	4	0
	Sun 28-Jul	Day	15:00		16:00	14	27	7	4	3	0	3	0	2	0
	Sun 28-Jul	Day	16:00		17:00	15	13	9	2	2	1	5	0	1	0
	Sun 28-Jul	Day	17:00		18:00	17	15	9	5	3	0	5	0	6	0
	Sun 28-Jul	Day	18:00		19:00	11	10	5	5	1	0	1	0	3	1
	Sun 28-Jul	Day	19:00		20:00	4	11	5	2	2	1	1	1	5	2
	Sun 28-Jul	Day	20:00		21:00	5	7	2	3	1	0	4	0	0	0
	Sun 28-Jul				Day Sum 2	-30		15		15		25		20	
	Sun 28-Jul				Day Total (FPC)	169		154		36		70		41	
	Sun 28-Jul	Night video	21:00		22:00	0	3	2	2	1	0	2	0	1	2
	Sun 28-Jul	Night video	22:00		23:00	0	5	0	2	0	0	0		0	0
	Sun 28-Jul	Night video	23:00		0:00	3	5	0	2	0	0	0	1	1	0
	Mon 29-Jul	Night video	0:00		1:00	0	2	0	0	0	0	0	0	0	1
	Mon 29-Jul	Night video	1:00		2:00	0	2	0	1	0	0	0	0	0	0
	Mon 29-Jul	Night video	2:00		3:00	0	2	0	1	0	0	1	0	0	0
	Mon 29-Jul	Night video	3:00		4:00	0	3	0	0	0	0	0	0	0	0
	Mon 29-Jul	Night video	4:00		5:00	1	4	0	1	0	0	0	0	0	0
	Sun 28-Jul / Mon 29-Jul				Night Sum	-22		-7		1		2		-1	

Hourly Adult Passage and Ladder Exit Temperature - LWG July 23-29

Operation	Date	Count	Start Time	Ladder Exit °F	End Time	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
	Mon 29-Jul	Day	5:00		6:00	1	4	1	0	0	1	1	0	0	0
	Mon 29-Jul	Day	6:00		7:00	11	9	1	4	4	0	7	0	0	0
	Mon 29-Jul	Day	7:00		8:00	8	13	2	0	3	3	6	2	0	0
	Mon 29-Jul	Day	8:00		9:00	12	7	9	7	5	4	1	0	1	0
	Mon 29-Jul	Day	9:00		10:00	10	5	2	0	0	0	5	1	0	1
	Mon 29-Jul	Day	10:00		11:00	7	4	5	2	4	2	4	2	1	0
FOP: Unit 2 + spill (min gen)	Mon 29-Jul	Day	11:00		12:00	8	7	5	4	3	0	1	0	0	0
	Mon 29-Jul	Day	12:00		13:00	4	3	1	1	5	0	0	0	1	0
	Mon 29-Jul				Day Sum 1	9	8	14	20	2					
	Mon 29-Jul	Day	13:00		14:00	15	16	2	3	0	0	4	0	0	1
	Mon 29-Jul	Day	14:00		15:00	14	13	0	0	3	1	3	0	0	0
	Mon 29-Jul	Day	15:00		16:00	1	2	0	0	1	1	1	0	0	0
	Mon 29-Jul	Day	16:00		17:00	0	1	1	3	0	0	3	0	0	0
	Mon 29-Jul	Day	17:00		18:00	6	3	0	0	2	0	2	0	0	0
	Mon 29-Jul	Day	18:00		19:00	2	2	0	1	1	0	1	1	1	0
	Mon 29-Jul	Day	19:00		20:00	5	9	0	0	1	0	0	1	0	0
	Mon 29-Jul	Day	20:00		21:00	2	2	0	0	0	0	0	1	0	0
	Mon 29-Jul				Day Sum 2	-3	-4	6	11	0					
	Mon 29-Jul				Day Total (FPC)	7	5	24	37	2					
	Mon 29-Jul	Night video	21:00		22:00										
	Mon 29-Jul	Night video	22:00		23:00										
	Mon 29-Jul	Night video	23:00		0:00										
	Tue 30-Jul	Night video	0:00		1:00										
	Tue 30-Jul	Night video	1:00		2:00										
	Tue 30-Jul	Night video	2:00		3:00										
	Tue 30-Jul	Night video	3:00		4:00										
Tue 30-Jul	Night video	4:00	5:00												
Mon 29-Jul / Tue 30-Jul				Night Sum											

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue 23-Jul	5:00	6:00	Unit 1	72.6	Day	8	0	6	0	0	0	0	0	0	0
Tue 23-Jul	6:00	7:00	Unit 1	72.8	Day	20	17	12	9	1	1	1	0	0	0
Tue 23-Jul	7:00	8:00	Unit 1	73.0	Day	29	24	33	14	7	1	3	1	1	0
Tue 23-Jul	8:00	9:00	FOP Unit 2	73.1	Day	17	20	23	28	2	1	1	0	0	0
Tue 23-Jul	9:00	10:00	FOP Unit 2	73.3	Day	4	5	1	7	1	3	1	1	0	0
Tue 23-Jul	10:00	11:00	FOP Unit 2	73.8	Day	7	14	2	0	2	0	1	1	0	0
Tue 23-Jul	11:00	12:00	FOP Unit 2	74.3	Day	2	5	0	0	0	1	0	0	0	1
Tue 23-Jul	12:00	13:00	FOP Unit 2	74.3	Day	5	5	0	2	6	2	2	0	1	0
Tue 23-Jul			Sum 0500-1300			2		17		10		6		1	
Tue 23-Jul	13:00	14:00	FOP Unit 2	74.3	Day										
Tue 23-Jul	14:00	15:00	FOP Unit 2	73.9	Day										
Tue 23-Jul	15:00	16:00	FOP Unit 2	73.9	Day										
Tue 23-Jul	16:00	17:00	FOP Unit 2	74.1	Day										
Tue 23-Jul	17:00	18:00	FOP Unit 2	75.1	Day										
Tue 23-Jul	18:00	19:00	FOP Unit 2	75.2	Day										
Tue 23-Jul	19:00	20:00	Unit 5 (5k)	75.8	Day										
Tue 23-Jul	20:00	21:00	Unit 5 (5k)	75.6	Day										
Tue 23-Jul			Sum 1300-2100			n/a		n/a		n/a		n/a		n/a	
Tue 23-Jul			Day Total (FPC)			0		22		19		7		2	
Tue 23-Jul	21:00	22:00	Unit 5 (5k)	75.5	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 23-Jul	22:00	23:00	Unit 5 (5k)	75.2	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 23-Jul	23:00	0:00	Unit 5 (5k)	74.9	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	0:00	1:00	Unit 5 (5k)	74.9	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 24-Jul	1:00	2:00	Unit 5 (5k)	75.1	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	2:00	3:00	Unit 5 (5k)	75.2	Night Video	0	1	0	0	0	0	0	0	0	0
Wed 24-Jul	3:00	4:00	Unit 5 (5k)	75.6	Night Video	0	0	1	1	0	0	0	0	0	0
Wed 24-Jul	4:00	5:00	Unit 5 (5k)	75.2	Night Video	0	0	1	0	0	0	0	0	0	0
Wed 24-Jul			Sum Night			-2		1		0		1		0	
Wed 24-Jul	5:00	6:00	Unit 5 (5k)	74.6	Day	2	2	1	2	0	0	0	0	0	0
Wed 24-Jul	6:00	7:00	Unit 1	75.1	Day	1	0	1	0	1	0	3	0	0	0
Wed 24-Jul	7:00	8:00	Unit 1	74.1	Day	2	0	2	1	2	0	2	1	0	0
Wed 24-Jul	8:00	9:00	Unit 1	74.7	Day	6	6	5	4	2	0	0	2	0	0
Wed 24-Jul	9:00	10:00	Unit 1	75.2	Day	7	10	9	4	2	4	2	2	0	1
Wed 24-Jul	10:00	11:00	Unit 1	75.3	Day	2	1	2	2	2	1	0	0	0	0
Wed 24-Jul	11:00	12:00	Unit 1	75.4	Day	19	10	8	8	0	0	2	0	0	0
Wed 24-Jul	12:00	13:00	Unit 1	74.8	Day	3	5	0	0	1	2	1	0	0	0
Wed 24-Jul			Sum 0500-1300			8		7		3		5		-1	
Wed 24-Jul	13:00	14:00	Unit 1	74.9	Day										
Wed 24-Jul	14:00	15:00	Unit 1	75.3	Day										
Wed 24-Jul	15:00	16:00	Unit 1	75.6	Day										
Wed 24-Jul	16:00	17:00	Unit 1	75.4	Day										
Wed 24-Jul	17:00	18:00	Unit 1	75.0	Day										
Wed 24-Jul	18:00	19:00	Unit 5 (5k)	75.3	Day										
Wed 24-Jul	19:00	20:00	Unit 5 (5k)	74.6	Day										
Wed 24-Jul	20:00	21:00	Unit 5 (5k)	74.0	Day										
Wed 24-Jul			Sum 1300-2100			n/a		n/a		n/a		n/a		n/a	
Wed 24-Jul			Day Total (FPC)			11		14		17		10		2	

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Wed 24-Jul	21:00	22:00	Unit 5 (5k)	74.2	Night Video	0	0	0	0	0	0	0	0	0	1
Wed 24-Jul	22:00	23:00	Unit 5 (5k)	73.9	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	23:00	0:00	Unit 5 (5k)	74.1	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	0:00	1:00	Unit 5 (5k)	74.1	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	1:00	2:00	Unit 5 (5k)	74.4	Night Video	0	0	1	0	0	0	0	0	0	0
Thu 25-Jul	2:00	3:00	Unit 5 (5k)	74.3	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	3:00	4:00	Unit 5 (5k)	73.6	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	4:00	5:00	Unit 5 (5k)	73.3	Night Video	0	0	0	0	0	0	1	1	0	0
Thu 25-Jul			Sum Night			0		1		0		0		-1	
Thu 25-Jul	5:00	6:00	Unit 5 (5k)	73.4	Day	1	0	0	0	0	0	4	1	0	0
Thu 25-Jul	6:00	7:00	Unit 1	73.4	Day	0	1	0	0	1	0	4	3	0	0
Thu 25-Jul	7:00	8:00	emerg. pumps installed	73.4	Day	8	2	5	1	5	0	4	0	0	0
Thu 25-Jul	8:00	9:00	Unit 1	73.1	Day	19	14	18	5	4	1	2	0	2	0
Thu 25-Jul	9:00	10:00	Unit 1	73.3	Day	24	9	14	5	6	0	4	1	2	0
Thu 25-Jul	10:00	11:00	Unit 1	73.2	Day	17	6	16	3	1	0	2	0	2	0
Thu 25-Jul	11:00	12:00	Unit 1	74.0	Day	28	14	14	2	4	0	9	3	4	0
Thu 25-Jul	12:00	13:00	Unit 1	73.6	Day	22	11	15	6	2	1	3	0	1	0
Thu 25-Jul			Sum 0500-1300			62		60		21		24		11	
Thu 25-Jul	13:00	14:00	Unit 1	73.9	Day	13	8	8	4	1	0	2	1	2	1
Thu 25-Jul	14:00	15:00	Unit 1	73.8	Day	26	12	18	6	3	5	7	4	1	1
Thu 25-Jul	15:00	16:00	Unit 1	74.3	Day	19	10	12	2	5	2	3	0	0	1
Thu 25-Jul	16:00	17:00	Unit 1	70.8	Day	45	5	25	0	1	0	8	1	5	0
Thu 25-Jul	17:00	18:00	Unit 1	70.5	Day	20	1	22	1	8	2	4	0	4	0
Thu 25-Jul	18:00	19:00	FOP Unit 2	70.8	Day	17	1	7	0	2	0	3	0	4	1
Thu 25-Jul	19:00	20:00	FOP Unit 2	70.2	Day	1	1	2	0	2	1	0	0	1	1
Thu 25-Jul	20:00	21:00	FOP Unit 2	69.9	Day	5	0	1	0	1	0	0	0	0	1
Thu 25-Jul			Sum 1300-2100			108		82		13		21		11	
Thu 25-Jul			Day Total (FPC)			204		170		41		54		26	

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Thu 25-Jul	21:00	22:00	FOP Unit 2	69.8	Night Video	0	0	0	0	0	0	0	0	2	0
Thu 25-Jul	22:00	23:00	FOP Unit 2	70.1	Night Video	1	0	0	0	0	0	0	0	0	0
Thu 25-Jul	23:00	0:00	FOP Unit 2	70.3	Night Video	0	0	0	1	0	0	0	0	0	0
Fri 26-Jul	0:00	1:00	FOP Unit 2	70.4	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	1:00	2:00	FOP Unit 2	70.1	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	2:00	3:00	FOP Unit 2	69.9	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	3:00	4:00	FOP Unit 2	70.0	Night Video	0	0	0	0	1	0	0	0	0	0
Fri 26-Jul	4:00	5:00	FOP Unit 2	69.9	Night Video	1	1	0	0	0	0	0	0	0	0
Fri 26-Jul			Sum Night			1		-1		1		0		2	
Fri 26-Jul	5:00	6:00	FOP Unit 2	70.2	Day	0	0	7	0	0	0	0	0	0	0
Fri 26-Jul	6:00	7:00	FOP Unit 2	70.1	Day	11	0	4	0	0	0	1	0	2	1
Fri 26-Jul	7:00	8:00	FOP Unit 2	70.5	Day	10	6	7	3	2	0	2	0	0	1
Fri 26-Jul	8:00	9:00	FOP Unit 2	70.9	Day	6	14	4	16	0	0	2	2	0	0
Fri 26-Jul	9:00	10:00	FOP Unit 2	70.9	Day	7	10	4	10	4	3	4	2	0	1
Fri 26-Jul	10:00	11:00	FOP Unit 2	70.8	Day	8	14	5	9	2	3	1	0	0	0
Fri 26-Jul	11:00	12:00	FOP Unit 2	71.2	Day	14	13	6	9	2	1	0	0	2	1
Fri 26-Jul	12:00	13:00	FOP Unit 2	71.1	Day	5	7	3	7	2	0	1	0	1	1
Fri 26-Jul			Sum 0500-1300			-3		-14		5		7		0	
Fri 26-Jul	13:00	14:00	FOP Unit 2	71.0	Day	1	6	1	4	2	1	1	0	0	1
Fri 26-Jul	14:00	15:00	FOP Unit 2	70.6	Day	1	9	1	3	0	0	2	0	0	2
Fri 26-Jul	15:00	16:00	FOP Unit 2	70.8	Day	4	2	0	2	0	0	2	0	2	2
Fri 26-Jul	16:00	17:00	FOP Unit 2	74.6	Day	1	9	1	1	0	0	4	3	0	1
Fri 26-Jul	17:00	18:00	FOP Unit 2	75.8	Day	0	4	1	1	0	0	1	2	0	0
Fri 26-Jul	18:00	19:00	FOP Unit 2	75.5	Day	0	0	0	0	0	0	1	0	0	0
Fri 26-Jul	19:00	20:00	FOP Unit 2	71.1	Day	1	1	4	1	0	0	1	0	0	0
Fri 26-Jul	20:00	21:00	FOP Unit 2	70.9	Day	1	0	2	0	1	0	1	0	1	0
Fri 26-Jul			Sum 1300-2100			-22		-2		2		8		-3	
Fri 26-Jul			Day Total (FPC)			-30		-19		8		18		-4	

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Fri 26-Jul	21:00	22:00	FOP Unit 2	70.6	Night Video	0	1	0	0	1	0	0	0	0	1
Fri 26-Jul	22:00	23:00	FOP Unit 2	71.0	Night Video	0	0	0	1	0	0	0	0	1	0
Fri 26-Jul	23:00	0:00	FOP Unit 2	71.4	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 27-Jul	0:00	1:00	FOP Unit 2	71.3	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	1:00	2:00	FOP Unit 2	71.4	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	2:00	3:00	FOP Unit 2	71.0	Night Video	1	1	0	0	0	0	0	0	0	0
Sat 27-Jul	3:00	4:00	FOP Unit 2	70.7	Night Video	3	3	0	0	0	0	1	0	0	0
Sat 27-Jul	4:00	5:00	FOP Unit 2	70.5	Night Video	0	0	0	1	0	0	1	0	0	0
Sat 27-Jul			Sum Night			1		-2		1		2		0	
Sat 27-Jul	5:00	6:00	FOP Unit 2	70.3	Day	3	1	2	2	0	0	1	0	0	0
Sat 27-Jul	6:00	7:00	FOP Unit 2	72.9	Day	3	2	2	1	5	3	1	0	0	0
Sat 27-Jul	7:00	8:00	FOP Unit 2	72.8	Day	2	1	1	1	0	0	0	0	0	0
Sat 27-Jul	8:00	9:00	FOP Unit 2	73.3	Day	1	1	2	1	1	0	4	1	0	0
Sat 27-Jul	9:00	10:00	FOP Unit 2	73.6	Day	0	0	0	0	1	0	1	0	0	0
Sat 27-Jul	10:00	11:00	Unit 1	73.9	Day	0	0	1	0	1	0	1	1	0	0
Sat 27-Jul	11:00	12:00	Unit 1	70.8	Day	11	0	7	0	1	0	7	1	0	0
Sat 27-Jul	12:00	13:00	Unit 1	70.2	Day	22	2	16	0	8	0	10	0	0	0
Sat 27-Jul			Sum 0500-1300			35		26		14		22		0	
Sat 27-Jul	13:00	14:00	Unit 1	70.2	Day	42	4	34	2	10	1	6	1	2	0
Sat 27-Jul	14:00	15:00	Unit 1	70.2	Day	77	3	39	7	3	1	5	0	4	0
Sat 27-Jul	15:00	16:00	Unit 1	70.3	Day	57	16	27	12	4	0	13	1	6	0
Sat 27-Jul	16:00	17:00	Unit 1	70.3	Day	34	35	20	16	3	1	6	0	6	1
Sat 27-Jul	17:00	18:00	Unit 1	69.9	Day	25	28	12	10	0	1	6	1	5	1
Sat 27-Jul	18:00	19:00	Unit 1	69.9	Day	22	21	8	6	0	1	4	1	2	0
Sat 27-Jul	19:00	20:00	Unit 1	69.9	Day	10	15	13	6	0	0	2	1	1	0
Sat 27-Jul	20:00	21:00	Unit 1	70.0	Day	6	9	3	1	0	0	1	0	1	0
Sat 27-Jul			Sum 1300-2100			142		96		15		38		25	
Sat 27-Jul			Day Total (FPC)			212		146		35		72		30	

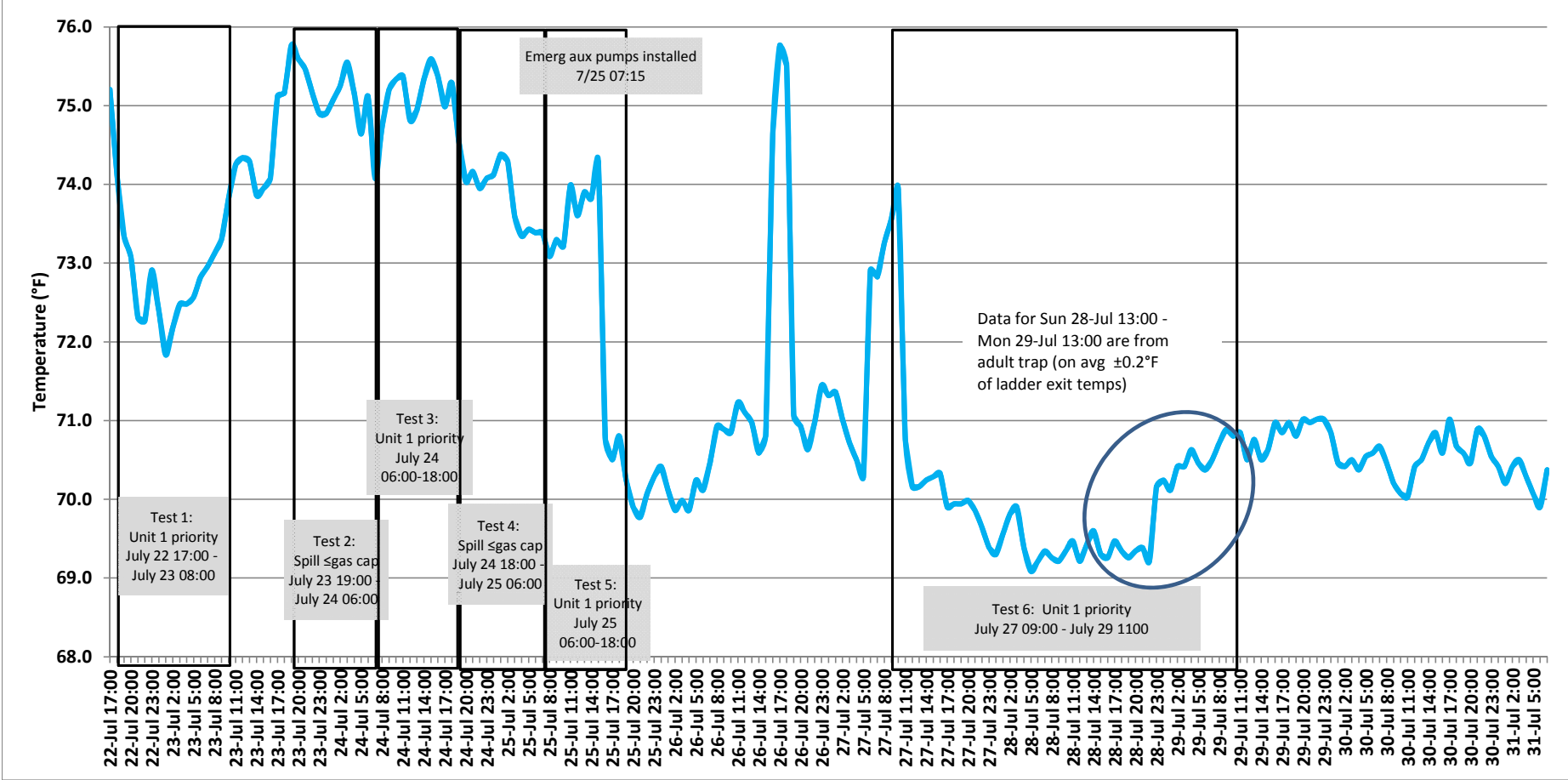
Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 27-Jul	21:00	22:00	Unit 1	69.9	Night Video	0	1	0	1	0	0	0	0	0	0
Sat 27-Jul	22:00	23:00	Unit 1	69.6	Night Video	2	3	0	1	1	0	0	0	0	0
Sat 27-Jul	23:00	0:00	Unit 1	69.4	Night Video	1	0	0	0	0	0	0	0	0	0
Sun 28-Jul	0:00	1:00	Unit 1	69.3	Night Video	0	3	0	1	0	0	0	0	0	0
Sun 28-Jul	1:00	2:00	Unit 1	69.6	Night Video	1	4	2	4	0	0	0	0	0	0
Sun 28-Jul	2:00	3:00	Unit 1	69.8	Night Video	1	5	0	2	0	0	0	0	0	0
Sun 28-Jul	3:00	4:00	Unit 1	69.9	Night Video	0	6	1	4	0	0	0	0	0	0
Sun 28-Jul	4:00	5:00	Unit 1	69.4	Night Video	0	5	0	6	1	1	1	0	0	1
Sun 28-Jul					Sum Night		-22		-16		1		1		-1
Sun 28-Jul	5:00	6:00	Unit 1	69.1	Day	13	8	7	1	0	0	0	0	0	1
Sun 28-Jul	6:00	7:00	Unit 1	69.2	Day	23	6	9	3	1	0	3	0	0	0
Sun 28-Jul	7:00	8:00	Unit 1	69.3	Day	63	12	33	7	3	0	9	0	5	3
Sun 28-Jul	8:00	9:00	Unit 1	69.3	Day	46	13	19	3	2	1	6	2	2	0
Sun 28-Jul	9:00	10:00	Unit 1	69.2	Day	24	5	24	4	1	0	1	0	4	1
Sun 28-Jul	10:00	11:00	Unit 1	69.3	Day	31	12	26	4	8	3	6	1	3	0
Sun 28-Jul	11:00	12:00	Unit 1	69.5	Day	34	14	22	9	1	0	7	0	5	1
Sun 28-Jul	12:00	13:00	Unit 1	69.2	Day	25	18	10	6	4	1	4	0	1	0
Sun 28-Jul			Sum 0500-1300			171		113		15		33		14	
Sun 28-Jul	13:00	14:00	Unit 1	69.4 (trap)	Day	19	26	8	14	3	0	3	1	2	0
Sun 28-Jul	14:00	15:00	Unit 1	69.6 (trap)	Day	26	32	12	7	2	0	5	0	4	0
Sun 28-Jul	15:00	16:00	Unit 1	69.3 (trap)	Day	14	27	7	4	3	0	3	0	2	0
Sun 28-Jul	16:00	17:00	Unit 1	69.3 (trap)	Day	15	13	9	2	2	1	5	0	1	0
Sun 28-Jul	17:00	18:00	Unit 1	69.4 (trap)	Day	17	15	9	5	3	0	5	0	6	0
Sun 28-Jul	18:00	19:00	Unit 1	69.3 (trap)	Day	11	10	5	5	1	0	1	0	3	1
Sun 28-Jul	19:00	20:00	Unit 1	69.3 (trap)	Day	4	11	5	2	2	1	1	1	5	2
Sun 28-Jul	20:00	21:00	Unit 1	69.3 (trap)	Day	5	7	2	3	1	0	4	0	0	0
Sun 28-Jul			Sum 1300-2100				-30	15		15		25		20	
Sun 28-Jul			Day Total (FPC)			169		154		36		70		41	

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sun 28-Jul	21:00	22:00	Unit 1	69.4 (trap)	Night Video	0	3	2	2	1	0	2	0	1	2
Sun 28-Jul	22:00	23:00	Unit 1	69.2 (trap)	Night Video	0	5	0	2	0	0	0	0	0	0
Sun 28-Jul	23:00	0:00	Unit 1	70.2 (trap)	Night Video	3	5	0	2	0	0	0	1	1	0
Mon 29-Jul	0:00	1:00	Unit 1	70.2 (trap)	Night Video	0	2	0	0	0	0	0	0	0	1
Mon 29-Jul	1:00	2:00	Unit 1	70.1 (trap)	Night Video	0	2	0	1	0	0	0	0	0	0
Mon 29-Jul	2:00	3:00	Unit 1	70.4 (trap)	Night Video	0	2	0	1	0	0	1	0	0	0
Mon 29-Jul	3:00	4:00	Unit 1	70.4 (trap)	Night Video	0	3	0	0	0	0	0	0	0	0
Mon 29-Jul	4:00	5:00	Unit 1	70.6 (trap)	Night Video	1	4	0	1	0	0	0	0	0	0
Mon 29-Jul			Sum Night				-22		-7		1		2		-1
Mon 29-Jul	5:00	6:00	Unit 1	70.5 (trap)	Day	1	4	1	0	0	1	1	0	0	0
Mon 29-Jul	6:00	7:00	Unit 1	70.4 (trap)	Day	11	9	1	4	4	0	7	0	0	0
Mon 29-Jul	7:00	8:00	Unit 1	70.5 (trap)	Day	8	13	2	0	3	3	6	2	0	0
Mon 29-Jul	8:00	9:00	Unit 1	70.7 (trap)	Day	12	7	9	7	5	4	1	0	1	0
Mon 29-Jul	9:00	10:00	Unit 1	70.9 (trap)	Day	10	5	2	0	0	0	5	1	0	1
Mon 29-Jul	10:00	11:00	Unit 1	70.8 (trap)	Day	7	4	5	2	4	2	4	2	1	0
Mon 29-Jul	11:00	12:00	FOP Unit 2	70.8 (trap)	Day	8	7	5	4	3	0	1	0	0	0
Mon 29-Jul	12:00	13:00	FOP Unit 2	70.5 (trap)	Day	4	3	1	1	5	0	0	0	1	0
Mon 29-Jul			Sum 0500-1300				9		8		14		20		2
Mon 29-Jul	13:00	14:00	FOP Unit 2	70.8 (trap)	Day	15	16	2	3	0	0	4	0	0	1
Mon 29-Jul	14:00	15:00	FOP Unit 2	70.5	Day	14	13	0	0	3	1	3	0	0	0
Mon 29-Jul	15:00	16:00	FOP Unit 2	70.6	Day	1	2	0	0	1	1	1	0	0	0
Mon 29-Jul	16:00	17:00	FOP Unit 2	71.0	Day	0	1	1	3	0	0	3	0	0	0
Mon 29-Jul	17:00	18:00	FOP Unit 2	70.8	Day	6	3	0	0	2	0	2	0	0	0
Mon 29-Jul	18:00	19:00	FOP Unit 2	71.0	Day	2	2	0	1	1	0	1	1	1	0
Mon 29-Jul	19:00	20:00	FOP Unit 2	70.8	Day	5	9	0	0	1	0	0	1	0	0
Mon 29-Jul	20:00	21:00	FOP Unit 2	71.0	Day	2	2	0	0	0	0	0	1	0	0
Mon 29-Jul			Sum 1300-2100				-3		-4		6		11		0
Mon 29-Jul			Day Total (FPC)				7		5		24		37		2

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Mon 29-Jul	21:00	22:00	FOP Unit 2	71.0	Night Video	0	3	0	1	0	0	0	0	0	1
Mon 29-Jul	22:00	23:00	FOP Unit 2	71.0	Night Video	0	1	0	0	0	0	0	0	0	0
Mon 29-Jul	23:00	0:00	FOP Unit 2	71.0	Night Video	2	3	0	0	0	0	0	0	0	0
Tue 30-Jul	0:00	1:00	FOP Unit 2	70.8	Night Video	1	0	0	0	0	0	0	1	0	0
Tue 30-Jul	1:00	2:00	FOP Unit 2	70.5	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	2:00	3:00	FOP Unit 2	70.4	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 30-Jul	3:00	4:00	FOP Unit 2	70.5	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	4:00	5:00	FOP Unit 2	70.4	Night Video	1	0	0	0	0	0	0	0	0	0
Tue 30-Jul			Sum Night				-4		-1		0		-1		-1
Tue 30-Jul	5:00	6:00	FOP Unit 2	70.5	Day	4	4	0	0	1	0	0	0	0	0
Tue 30-Jul	6:00	7:00	FOP Unit 2	70.6	Day	1	0	1	0	0	0	2	0	0	0
Tue 30-Jul	7:00	8:00	FOP Unit 2	70.7	Day	4	0	2	0	3	0	2	0	0	0
Tue 30-Jul	8:00	9:00	FOP Unit 2	70.5	Day	5	1	2	1	3	0	3	0	1	0
Tue 30-Jul	9:00	10:00	FOP Unit 2	70.2	Day	0	1	3	0	1	0	4	0	0	0
Tue 30-Jul	10:00	11:00	FOP Unit 2	70.1	Day	3	1	1	0	2	0	4	0	1	0
Tue 30-Jul	11:00	12:00	FOP Unit 2	70.0	Day	2	3	2	1	0	0	0	0	0	0
Tue 30-Jul	12:00	13:00	FOP Unit 2	70.4	Day	3	4	2	2	2	0	3	0	0	0
Tue 30-Jul			Sum 0500-1300				8		9		12		18		2
Tue 30-Jul	13:00	14:00	FOP Unit 2	70.5	Day	2	5	8	2	1	1	2	0	0	0
Tue 30-Jul	14:00	15:00	FOP Unit 2	70.7	Day	5	2	2	2	0	0	1	0	0	0
Tue 30-Jul	15:00	16:00	FOP Unit 2	70.8	Day	9	9	3	1	1	0	1	0	0	0
Tue 30-Jul	16:00	17:00	FOP Unit 2	70.6	Day	7	3	3	4	3	0	2	0	0	0
Tue 30-Jul	17:00	18:00	FOP Unit 2	71.0	Day	6	5	1	1	2	0	2	1	0	0
Tue 30-Jul	18:00	19:00	FOP Unit 2	70.7	Day	7	9	0	1	0	0	1	0	0	0
Tue 30-Jul	19:00	20:00	FOP Unit 2	70.6	Day	0	0	0	1	1	0	1	0	0	0
Tue 30-Jul	20:00	21:00	FOP Unit 2	70.5	Day	2	2	0	0	0	0	1	0	0	0
Tue 30-Jul			Sum 1300-2100				3		5		7		10		0
Tue 30-Jul			Day Total (FPC)				13		17		23		34		2

Date	Start Time	End Time	Unit	Ladder Exit	Count	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
			Priority	Start Temp (°F)	Period	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue 30-Jul	21:00	22:00	FOP Unit 2	70.9	Night Video										
Tue 30-Jul	22:00	23:00	FOP Unit 2	70.8	Night Video										
Tue 30-Jul	23:00	0:00	FOP Unit 2	70.5	Night Video										
Wed 31-Jul	0:00	1:00	FOP Unit 2	70.4	Night Video										
Wed 31-Jul	1:00	2:00	FOP Unit 2	70.2	Night Video										
Wed 31-Jul	2:00	3:00	FOP Unit 2	70.4	Night Video										
Wed 31-Jul	3:00	4:00	FOP Unit 2	70.5	Night Video										
Wed 31-Jul	4:00	5:00	FOP Unit 2	70.3	Night Video										
Wed 31-Jul			Sum Night												
Wed 31-Jul	5:00	6:00	FOP Unit 2	70.1	Day										
Wed 31-Jul	6:00	7:00	FOP Unit 2	69.9	Day										
Wed 31-Jul	7:00	8:00	FOP Unit 2	70.4	Day										
Wed 31-Jul	8:00	9:00	FOP Unit 2		Day										
Wed 31-Jul	9:00	10:00	FOP Unit 2		Day										
Wed 31-Jul	10:00	11:00	FOP Unit 2		Day										
Wed 31-Jul	11:00	12:00	Unit 1		Day										
Wed 31-Jul	12:00	13:00	Unit 1		Day										
Wed 31-Jul			Sum 0500-1300												
Wed 31-Jul	13:00	14:00	Unit 1		Day										
Wed 31-Jul	14:00	15:00	Unit 1		Day										
Wed 31-Jul	15:00	16:00	Unit 1		Day										
Wed 31-Jul	16:00	17:00	Unit 1		Day										
Wed 31-Jul	17:00	18:00	Unit 1		Day										
Wed 31-Jul	18:00	19:00	Unit 1		Day										
Wed 31-Jul	19:00	20:00	Unit 1		Day										
Wed 31-Jul	20:00	21:00	Unit 1		Day										
Wed 31-Jul			Sum 1300-2100												
Wed 31-Jul			Day Total (FPC)												

LWG Adult Ladder Exit Temp (°F)



Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

July 31, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference call was chaired and facilitated by Doug Baus, COE. Representatives of the COE, BPA, BOR, Montana, Colville Tribe, NOAA, Oregon, CRITFC/Umatilla, Washington, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lower Granite Dam Operations for Adult Ladder Temperature Issues

The unit 1 priority operation coordinated with TMT consensus during the July 26 TMT meeting ended on July 29 (1200 hours) and Lower Granite Dam (LWG) reverted back to the unit 2 priority operation identified in the FPP. The goal of today's meeting was to evaluate the unit 1 priority data over the weekend in order to determine future unit priority operations.

As of 0800 hours today unit 2 outflows were 11.6 kcfs and LWG was spilling 12.3 kcfs, Baus reported. Sockeye passage during unit 2 priority operation was as follows: 1) July 26 = -4, and; 2) July 29 = 2. Sockeye passage during unit 1 priority operation was as follows: 1) July 27 = 30, and; 2) July 28 = 41.

Attachment 2a to today's agenda gives adult temperature hourly data, while attachment 2b is a graph of hourly ladder exit temperature readings. Attachment 2c shows Dworshak flow augmentation release temperatures.

Ann Setter, COE, gave a project update. The auxiliary pump at Lower Granite is operating similarly to last weekend. Its cooling effect appears to be consistent. The operation implemented last week did successfully stabilize ladder temperatures. Currently it appears the spill pattern associated with Unit 2 has created a flat spot in the center of the eddy where debris has accumulated. Floating orifices were in operation at Lower Granite units 1, 4, 7 and 10 that provide access to the adult collection channel across the tailrace. Setter observed that cool water contributions to the ladder are diluted by half whenever the trap is operating.

Paul Wagner, NOAA, gave FPAC's recommendation after an evaluation of the recent unit 1 priority operation data: Discontinue the FPP unit 2 priority operation and resume unit 1 priority operation and review the results on Monday, August 5. There has been frustration among FPAC members with the lack of timely temperature data on which to base decisions about this operation. The

tradeoff between adult and juvenile passage at Lower Granite makes this decision making especially difficult.

During these low flow conditions maintaining multiple project requirements are challenging. For example, if outflows exceed inflows then LWG would be required to draft and subsequently not be able to operate within MOP. This could occur when inflows drop below 24 kcfs because outflows of unit 1 (17 kcfs) plus RSW (7 kcfs) equal approximately 24 kcfs. If LWG was unable to maintain MOP with both unit and RSW operations then LWG would operate a unit at its respective minimum generation, close the RSW, and spill the remainder of inflow in accordance with the non-RSW pattern in the FPP. Currently, Lower Granite inflows are around 23-25 kcfs, which is the problem range, Laura Hamilton, COE, noted. TMT's discussion turned to next steps in the event the RSW needs to be closed. Setter suggested transitioning to a flat spill or non-RSW pattern per the FPP. The lowest rate for flat spill identified in the FPP is 10 kcfs. Setter asked for advice if flows should drop this low.

TMT members then considered the option of operating Unit 1 at a slightly lower minimum flow rate (approximately 16.5 kcfs rather than 17.0 kcfs) based on some recent conversations between NOAA and COE staff. The COE will investigate that option further and report back to TMT, Baus said. Russ Kiefer said Idaho would prefer to keep the RSW running if at all possible in order to keep forebay temperatures down. Another option is to not spill through the RSW, Scott Bettin, BPA, suggested, but Kiefer said this would not be desirable.

Dan Baker, IDFG, suggested running 17-17.2 kcfs through Unit 1 during peak passage time in the daytime, then operating Unit 2 at a lower flow output during the off-peak hours. Hamilton pointed out that turning spill off at Lower Granite and using Unit 1 sends only 17 kcfs downstream to Little Goose, which can have unexpected consequences throughout the system.

Charles Morrill, **Washington**, said running Unit 1 during daytime only is a compromise worth considering. Russ Kiefer, **Idaho**, recommended operating Unit 1 to the extent possible and operating the RSW or switching to Unit 2 as needed. Running Unit 2 at night would keep a steady flow moving through the RSW route.

Baus cautioned that it might be difficult to execute that operation in real time. The only way it would be possible would be increased flexibility in terms of how high the pool goes above MOP, Bill Proctor, COE, said.

The lack of temperature data for a 24-hour period on July 28-29 has made it difficult to make informed decisions regarding Lower Granite operations, Erick Van Dyke, **Oregon**, said. If Unit 1 is truly benefiting adult passage, Oregon would support that unit priority, but the corresponding cost to juveniles makes Oregon reluctant to commit to a Unit 1 priority without more information. Setter said the missing data cannot be recovered. Lisa Wright, COE, reported that the ladder

temperature increased just over 1.0 degrees F in the 24-hour period from July 28 to July 29, from 69.2 degrees F to 70.5 degrees F. Both Oregon and Washington expressed appreciation for the COE's diligent efforts to retrieve the temperature data from the ladder.

Steve Hall, COE, presented attachment 2c which graphs the temperatures of augmentation releases from Dworsak. At the request of Kiefer, Hall added a line showing temperatures at 2.3 meters depth, which are mainly denotes the extent of heating effects resulting from solar radiation. The COE will continue to run the model on a daily basis.

Effective today, the Action Agencies will switch Lower Granite unit priority to Unit 1 through midnight Monday, August 5.

3. Lower Granite Adult Sockeye Transportation

Kiefer said Idaho is considering whether the cooling trend in the weather might allow another attempt at trapping adults for a sockeye trap and haul operation. IDFG has found that whenever Diffuser #14 is left open to keep the trap running, ladder temperatures climb and fish stop moving so the researchers can't trap any.

Kiefer asked whether the COE has any ideas that might facilitate another sockeye trapping attempt. The COE will continue to seek opportunities for a trap and haul operation, but no immediate relief from high forebay temperatures is anticipated, Hall replied. Kiefer asked whether the temperature string in the forebay does a fairly accurate job of showing likely temperatures if Diffuser #14 is opened, and Setter said it's considered representative.

Given these conditions, Idaho did not propose another trapping attempt because the likelihood of success appeared low. TMT will next revisit Lower Granite operations at 10:30 am August 2.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Tony Norris	BPA
John Roache	BOR
Jim Litchfield	Montana
Scott Bettin	BPA
Sheri Sears	Colville
Barry Espenson	CBB
Paul Wagner	NOAA
Steve Hall	COE
Erick Van Dyke	Oregon
Tom Lorz	CRITFC/Umatilla
Margaret Filardo	FPC

Brandon Chockley	FPC
Charles Morrill	Washington
Ann Setter	COE Walla Walla
Greg Moody	COE Walla Walla
Russ Kiefer	Idaho
Heather Dohan	Puget
Dan Baker	IDFG
Laura Hamilton	COE
Bill Proctor	COE
Lisa Wright	COE
Dan Feil	COE
Steve Hall	COE Walla Walla

TECHNICAL MANAGEMENT TEAM

NOAA:	<i>Paul Wagner / Richard Domingue</i>	USFWS:	<i>David Wills / Steve Haeseker</i>
OR:	<i>Erick Van Dyke</i>	ID:	<i>Russ Kiefer / Pete Hassemer</i>
WA:	<i>Charles Morrill</i>	MT:	<i>Jim Litchfield / Brian Marotz</i>
Kootenai:	<i>Sue Ireland / Billy Barquin</i>	Spokane:	<i>Andy Miller</i>
Colville:	<i>Sheri Sears / Keith Wolf</i>	Nez Perce:	<i>Dave Statler</i>
Umatilla:	<i>Tom Lorz (CRITFC)</i>	Salish-Kootenai:	<i>Stu Levit</i>
BPA:	<i>Tony Norris / Scott Bettin / Robyn MacKay</i>	BOR:	<i>John Roache / Mary Mellema / Pat McGrane</i>
COE:	<i>Doug Baus / Karl Kanbergs</i>		

TMT CONFERENCE CALL

Friday, August 2, 2013 10:30am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 9243

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**We have had disruptions when people do not mute their phones.
Please MUTE your phone.**

*All members are encouraged to contact Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Lower Granite Dam Operations for Adult Ladder Temperature Issues - *Doug Baus, COE NWD / Ann Setter, COE NWW / Russ Kiefer, Idaho*
 - a. *updated Fri, 2 Aug 10:00* - LWG Adult Passage Counts and Ladder Temperature Hourly Data. [\[PDF\]](#) [\[Excel\]](#)
 - b. *updated Fri, 2 Aug 10:00* - [LWG Adult Ladder Exit Temperature Graph.](#)
3. Other
 - a. Set agenda and date for next meeting - **August 7, 2013**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down	Chinook jack Up Down	Steelhead clipped Up Down	Steelhead wild Up Down	Sockeye Up Down
Mon 22-Jul	5:00	6:00	FOP Unit 2	73.3°F	Day					
Mon 22-Jul	6:00	7:00	FOP Unit 2	73.7°F	Day					
Mon 22-Jul	7:00	8:00	FOP Unit 2	73.9°F	Day					
Mon 22-Jul	8:00	9:00	FOP Unit 2	74.0°F	Day					
Mon 22-Jul	9:00	10:00	FOP Unit 2	74.0°F	Day					
Mon 22-Jul	10:00	11:00	FOP Unit 2	75.0°F	Day					
Mon 22-Jul	11:00	12:00	FOP Unit 2	75.1°F	Day					
Mon 22-Jul	12:00	13:00	FOP Unit 2	75.4°F	Day					
Mon 22-Jul				Sum 0500-1300		n/a	n/a	n/a	n/a	n/a
Mon 22-Jul	13:00	14:00	FOP Unit 2	75.1°F	Day					
Mon 22-Jul	14:00	15:00	FOP Unit 2	74.8°F	Day					
Mon 22-Jul	15:00	16:00	FOP Unit 2	74.5°F	Day					
Mon 22-Jul	16:00	17:00	FOP Unit 2	75.2°F	Day					
Mon 22-Jul	17:00	18:00	Unit 1	75.2°F	Day					
Mon 22-Jul	18:00	19:00	Unit 1	74.1°F	Day					
Mon 22-Jul	19:00	20:00	Unit 1	73.3°F	Day					
Mon 22-Jul	20:00	21:00	Unit 1	73.1°F	Day					
Mon 22-Jul				Sum 1300-2100		n/a	n/a	n/a	n/a	n/a
Mon 22-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			20	11	16	10	6
Mon 22-Jul	21:00	22:00	Unit 5 (5k)	72.3°F	Night Video					
Mon 22-Jul	22:00	23:00	Unit 5 (5k)	72.3°F	Night Video					
Mon 22-Jul	23:00	0:00	Unit 5 (5k)	72.9°F	Night Video					
Tue 23-Jul	0:00	1:00	Unit 5 (5k)	72.4°F	Night Video					
Tue 23-Jul	1:00	2:00	Unit 5 (5k)	71.8°F	Night Video					
Tue 23-Jul	2:00	3:00	Unit 5 (5k)	72.2°F	Night Video					
Tue 23-Jul	3:00	4:00	Unit 5 (5k)	72.5°F	Night Video					
Tue 23-Jul	4:00	5:00	Unit 5 (5k)	72.5°F	Night Video					
Tue 23-Jul				Sum Night		n/a	n/a	n/a	n/a	n/a
Tue 23-Jul	5:00	6:00	Unit 1	72.6°F	Day	8	0	0	0	0
Tue 23-Jul	6:00	7:00	Unit 1	72.8°F	Day	20	17	1	0	0
Tue 23-Jul	7:00	8:00	Unit 1	73.0°F	Day	29	24	3	1	0
Tue 23-Jul	8:00	9:00	FOP Unit 2	73.1°F	Day	17	20	2	0	0
Tue 23-Jul	9:00	10:00	FOP Unit 2	73.3°F	Day	4	5	1	1	0
Tue 23-Jul	10:00	11:00	FOP Unit 2	73.8°F	Day	7	14	2	1	0
Tue 23-Jul	11:00	12:00	FOP Unit 2	74.3°F	Day	2	5	0	0	1
Tue 23-Jul	12:00	13:00	FOP Unit 2	74.3°F	Day	5	5	0	2	0
Tue 23-Jul				Sum 0500-1300		2	17	10	6	1
Tue 23-Jul	13:00	14:00	FOP Unit 2	74.3°F	Day					
Tue 23-Jul	14:00	15:00	FOP Unit 2	73.9°F	Day					
Tue 23-Jul	15:00	16:00	FOP Unit 2	73.9°F	Day					
Tue 23-Jul	16:00	17:00	FOP Unit 2	74.1°F	Day					
Tue 23-Jul	17:00	18:00	FOP Unit 2	75.1°F	Day					
Tue 23-Jul	18:00	19:00	FOP Unit 2	75.2°F	Day					
Tue 23-Jul	19:00	20:00	Unit 5 (5k)	75.8°F	Day					
Tue 23-Jul	20:00	21:00	Unit 5 (5k)	75.6°F	Day					
Tue 23-Jul				Sum 1300-2100		n/a	n/a	n/a	n/a	n/a
Tue 23-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			0	22	19	7	2

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue 23-Jul	21:00	22:00	Unit 5 (5k)	75.5°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 23-Jul	22:00	23:00	Unit 5 (5k)	75.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 23-Jul	23:00	0:00	Unit 5 (5k)	74.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	0:00	1:00	Unit 5 (5k)	74.9°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 24-Jul	1:00	2:00	Unit 5 (5k)	75.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	2:00	3:00	Unit 5 (5k)	75.2°F	Night Video	0	1	0	0	0	0	0	0	0	0
Wed 24-Jul	3:00	4:00	Unit 5 (5k)	75.6°F	Night Video	0	0	1	1	0	0	0	0	0	0
Wed 24-Jul	4:00	5:00	Unit 5 (5k)	75.2°F	Night Video	0	0	1	0	0	0	0	0	0	0
Wed 24-Jul					Sum Night		-2		1		0		1		0
Wed 24-Jul	5:00	6:00	Unit 5 (5k)	74.6°F	Day	2	2	1	2	0	0	0	0	0	0
Wed 24-Jul	6:00	7:00	Unit 1	75.1°F	Day	1	0	1	0	1	0	3	0	0	0
Wed 24-Jul	7:00	8:00	Unit 1	74.1°F	Day	2	0	2	1	2	0	2	1	0	0
Wed 24-Jul	8:00	9:00	Unit 1	74.7°F	Day	6	6	5	4	2	0	0	2	0	0
Wed 24-Jul	9:00	10:00	Unit 1	75.2°F	Day	7	10	9	4	2	4	2	2	0	1
Wed 24-Jul	10:00	11:00	Unit 1	75.3°F	Day	2	1	2	2	2	1	0	0	0	0
Wed 24-Jul	11:00	12:00	Unit 1	75.4°F	Day	19	10	8	8	0	0	2	0	0	0
Wed 24-Jul	12:00	13:00	Unit 1	74.8°F	Day	3	5	0	0	1	2	1	0	0	0
Wed 24-Jul					Sum 0500-1300		8		7		3		5		-1
Wed 24-Jul	13:00	14:00	Unit 1	74.9°F	Day										
Wed 24-Jul	14:00	15:00	Unit 1	75.3°F	Day										
Wed 24-Jul	15:00	16:00	Unit 1	75.6°F	Day										
Wed 24-Jul	16:00	17:00	Unit 1	75.4°F	Day										
Wed 24-Jul	17:00	18:00	Unit 1	75.0°F	Day										
Wed 24-Jul	18:00	19:00	Unit 5 (5k)	75.3°F	Day										
Wed 24-Jul	19:00	20:00	Unit 5 (5k)	74.6°F	Day										
Wed 24-Jul	20:00	21:00	Unit 5 (5k)	74.0°F	Day										
Wed 24-Jul					Sum 1300-2100		n/a		n/a		n/a		n/a		n/a
Wed 24-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				11		14		17		10		2
Wed 24-Jul	21:00	22:00	Unit 5 (5k)	74.2°F	Night Video	0	0	0	0	0	0	0	0	0	1
Wed 24-Jul	22:00	23:00	Unit 5 (5k)	73.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	23:00	0:00	Unit 5 (5k)	74.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	0:00	1:00	Unit 5 (5k)	74.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	1:00	2:00	Unit 5 (5k)	74.4°F	Night Video	0	0	1	0	0	0	0	0	0	0
Thu 25-Jul	2:00	3:00	Unit 5 (5k)	74.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	3:00	4:00	Unit 5 (5k)	73.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	4:00	5:00	Unit 5 (5k)	73.3°F	Night Video	0	0	0	0	0	0	1	1	0	0
Thu 25-Jul					Sum Night		0		1		0		0		-1
Thu 25-Jul	5:00	6:00	Unit 5 (5k)	73.4°F	Day	1	0	0	0	0	0	4	1	0	0
Thu 25-Jul	6:00	7:00	Unit 1	73.4°F	Day	0	1	0	0	1	0	4	3	0	0
Thu 25-Jul	7:00	8:00	emerg. pumps installed	73.4°F	Day	8	2	5	1	5	0	4	0	0	0
Thu 25-Jul	8:00	9:00	Unit 1	73.1°F	Day	19	14	18	5	4	1	2	0	2	0
Thu 25-Jul	9:00	10:00	Unit 1	73.3°F	Day	24	9	14	5	6	0	4	1	2	0
Thu 25-Jul	10:00	11:00	Unit 1	73.2°F	Day	17	6	16	3	1	0	2	0	2	0
Thu 25-Jul	11:00	12:00	Unit 1	74.0°F	Day	28	14	14	2	4	0	9	3	4	0
Thu 25-Jul	12:00	13:00	Unit 1	73.6°F	Day	22	11	15	6	2	1	3	0	1	0
Thu 25-Jul					Sum 0500-1300		62		60		21		24		11
Thu 25-Jul	13:00	14:00	Unit 1	73.9°F	Day	13	8	8	4	1	0	2	1	2	1
Thu 25-Jul	14:00	15:00	Unit 1	73.8°F	Day	26	12	18	6	3	5	7	4	1	1
Thu 25-Jul	15:00	16:00	Unit 1	74.3°F	Day	19	10	12	2	5	2	3	0	0	1
Thu 25-Jul	16:00	17:00	Unit 1	70.8°F	Day	45	5	25	0	1	0	8	1	5	0
Thu 25-Jul	17:00	18:00	Unit 1	70.5°F	Day	20	1	22	1	8	2	4	0	4	0
Thu 25-Jul	18:00	19:00	FOP Unit 2	70.8°F	Day	17	1	7	0	2	0	3	0	4	1
Thu 25-Jul	19:00	20:00	FOP Unit 2	70.2°F	Day	1	1	2	0	2	1	0	0	1	1
Thu 25-Jul	20:00	21:00	FOP Unit 2	69.9°F	Day	5	0	1	0	1	0	0	0	0	1
Thu 25-Jul					Sum 1300-2100		108		82		13		21		11
Thu 25-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				204		170		41		54		26

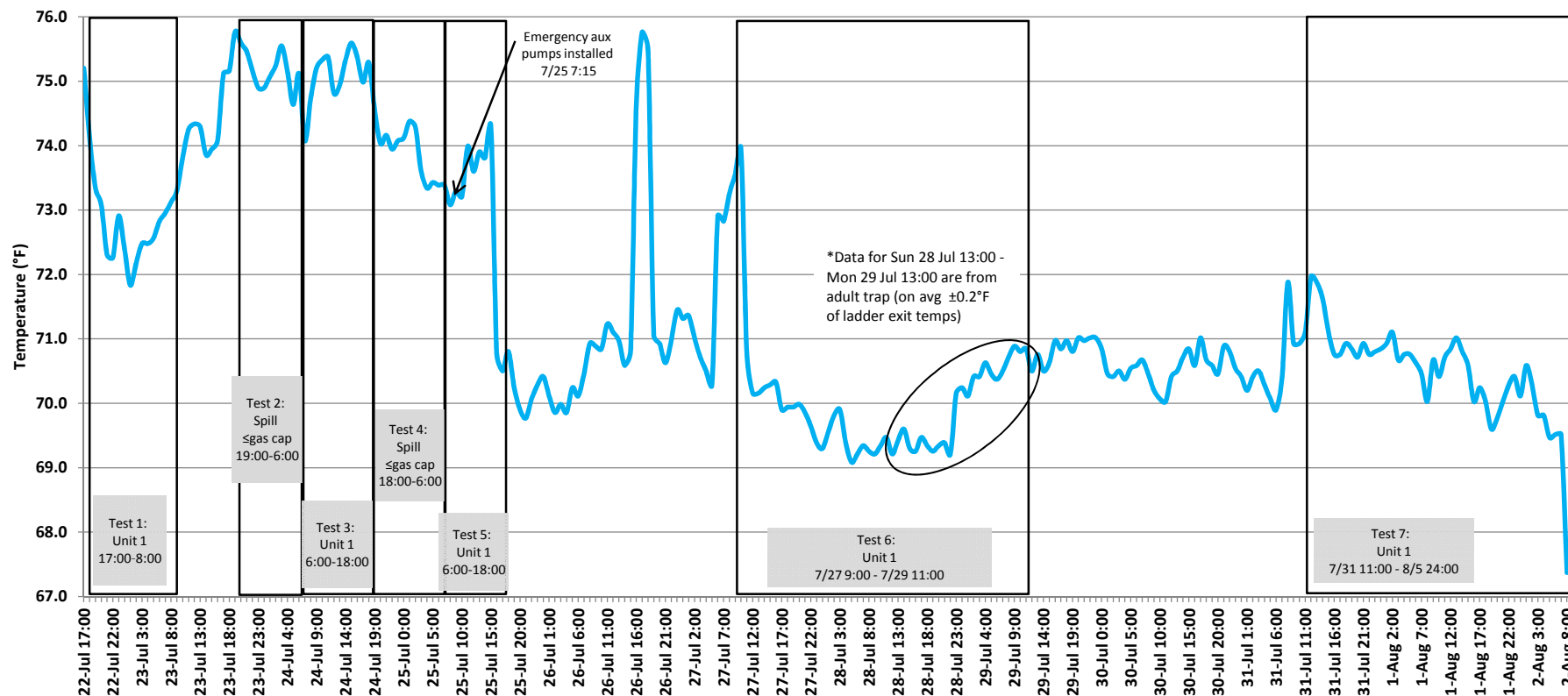
Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Thu 25-Jul	21:00	22:00	FOP Unit 2	69.8°F	Night Video	0	0	0	0	0	0	0	0	2	0
Thu 25-Jul	22:00	23:00	FOP Unit 2	70.1°F	Night Video	1	0	0	0	0	0	0	0	0	0
Thu 25-Jul	23:00	0:00	FOP Unit 2	70.3°F	Night Video	0	0	0	1	0	0	0	0	0	0
Fri 26-Jul	0:00	1:00	FOP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	1:00	2:00	FOP Unit 2	70.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	2:00	3:00	FOP Unit 2	69.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	3:00	4:00	FOP Unit 2	70.0°F	Night Video	0	0	0	0	1	0	0	0	0	0
Fri 26-Jul	4:00	5:00	FOP Unit 2	69.9°F	Night Video	1	1	0	0	0	0	0	0	0	0
Fri 26-Jul					Sum Night		1		-1		1		0		2
Fri 26-Jul	5:00	6:00	FOP Unit 2	70.2°F	Day	0	0	7	0	0	0	0	0	0	0
Fri 26-Jul	6:00	7:00	FOP Unit 2	70.1°F	Day	11	0	4	0	0	0	1	0	2	1
Fri 26-Jul	7:00	8:00	FOP Unit 2	70.5°F	Day	10	6	7	3	2	0	2	0	0	1
Fri 26-Jul	8:00	9:00	FOP Unit 2	70.9°F	Day	6	14	4	16	0	0	2	2	0	0
Fri 26-Jul	9:00	10:00	FOP Unit 2	70.9°F	Day	7	10	4	10	4	3	4	2	0	1
Fri 26-Jul	10:00	11:00	FOP Unit 2	70.8°F	Day	8	14	5	9	2	3	1	0	0	0
Fri 26-Jul	11:00	12:00	FOP Unit 2	71.2°F	Day	14	13	6	9	2	1	0	0	2	1
Fri 26-Jul	12:00	13:00	FOP Unit 2	71.1°F	Day	5	7	3	7	2	0	1	0	1	1
Fri 26-Jul					Sum 0500-1300		-3		-14		5		7		0
Fri 26-Jul	13:00	14:00	FOP Unit 2	71.0°F	Day	1	6	1	4	2	1	1	0	0	1
Fri 26-Jul	14:00	15:00	FOP Unit 2	70.6°F	Day	1	9	1	3	0	0	2	0	0	2
Fri 26-Jul	15:00	16:00	FOP Unit 2	70.8°F	Day	4	2	0	2	0	0	2	0	2	2
Fri 26-Jul	16:00	17:00	FOP Unit 2	74.6°F	Day	1	9	1	1	0	0	4	3	0	1
Fri 26-Jul	17:00	18:00	FOP Unit 2	75.8°F	Day	0	4	1	1	0	0	1	2	0	0
Fri 26-Jul	18:00	19:00	FOP Unit 2	75.5°F	Day	0	0	0	0	0	0	1	0	0	0
Fri 26-Jul	19:00	20:00	FOP Unit 2	71.1°F	Day	1	1	4	1	0	0	1	0	0	0
Fri 26-Jul	20:00	21:00	FOP Unit 2	70.9°F	Day	1	0	2	0	1	0	1	0	1	0
Fri 26-Jul					Sum 1300-2100		-22		-2		2		8		-3
Fri 26-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				-30		-19		8		18		-4
Fri 26-Jul	21:00	22:00	FOP Unit 2	70.6°F	Night Video	0	1	0	0	1	0	0	0	0	1
Fri 26-Jul	22:00	23:00	FOP Unit 2	71.0°F	Night Video	0	0	0	1	0	0	0	0	1	0
Fri 26-Jul	23:00	0:00	FOP Unit 2	71.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 27-Jul	0:00	1:00	FOP Unit 2	71.3°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	1:00	2:00	FOP Unit 2	71.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	2:00	3:00	FOP Unit 2	71.0°F	Night Video	1	1	0	0	0	0	0	0	0	0
Sat 27-Jul	3:00	4:00	FOP Unit 2	70.7°F	Night Video	3	3	0	0	0	0	1	0	0	0
Sat 27-Jul	4:00	5:00	FOP Unit 2	70.5°F	Night Video	0	0	0	1	0	0	1	0	0	0
Sat 27-Jul					Sum Night		1		-2		1		2		0
Sat 27-Jul	5:00	6:00	FOP Unit 2	70.3°F	Day	3	1	2	2	0	0	1	0	0	0
Sat 27-Jul	6:00	7:00	FOP Unit 2	72.9°F	Day	3	2	2	1	5	3	1	0	0	0
Sat 27-Jul	7:00	8:00	FOP Unit 2	72.8°F	Day	2	1	1	1	0	0	0	0	0	0
Sat 27-Jul	8:00	9:00	FOP Unit 2	73.3°F	Day	1	1	2	1	1	0	4	1	0	0
Sat 27-Jul	9:00	10:00	FOP Unit 2	73.6°F	Day	0	0	0	0	1	0	1	0	0	0
Sat 27-Jul	10:00	11:00	Unit 1	73.9°F	Day	0	0	1	0	1	0	1	1	0	0
Sat 27-Jul	11:00	12:00	Unit 1	70.8°F	Day	11	0	7	0	1	0	7	1	0	0
Sat 27-Jul	12:00	13:00	Unit 1	70.2°F	Day	22	2	16	0	8	0	10	0	0	0
Sat 27-Jul					Sum 0500-1300		35		26		14		22		0
Sat 27-Jul	13:00	14:00	Unit 1	70.2°F	Day	42	4	34	2	10	1	6	1	2	0
Sat 27-Jul	14:00	15:00	Unit 1	70.2°F	Day	77	3	39	7	3	1	5	0	4	0
Sat 27-Jul	15:00	16:00	Unit 1	70.3°F	Day	57	16	27	12	4	0	13	1	6	0
Sat 27-Jul	16:00	17:00	Unit 1	70.3°F	Day	34	35	20	16	3	1	6	0	6	1
Sat 27-Jul	17:00	18:00	Unit 1	69.9°F	Day	25	28	12	10	0	1	6	1	5	1
Sat 27-Jul	18:00	19:00	Unit 1	69.9°F	Day	22	21	8	6	0	1	4	1	2	0
Sat 27-Jul	19:00	20:00	Unit 1	69.9°F	Day	10	15	13	6	0	0	2	1	1	0
Sat 27-Jul	20:00	21:00	Unit 1	70.0°F	Day	6	9	3	1	0	0	1	0	1	0
Sat 27-Jul					Sum 1300-2100		142		96		15		38		25
Sat 27-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				212		146		35		72		30

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 27-Jul	21:00	22:00	Unit 1	69.9°F	Night Video	0	1	0	1	0	0	0	0	0	0
Sat 27-Jul	22:00	23:00	Unit 1	69.6°F	Night Video	2	3	0	1	1	0	0	0	0	0
Sat 27-Jul	23:00	0:00	Unit 1	69.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sun 28-Jul	0:00	1:00	Unit 1	69.3°F	Night Video	0	3	0	1	0	0	0	0	0	0
Sun 28-Jul	1:00	2:00	Unit 1	69.6°F	Night Video	1	4	2	4	0	0	0	0	0	0
Sun 28-Jul	2:00	3:00	Unit 1	69.8°F	Night Video	1	5	0	2	0	0	0	0	0	0
Sun 28-Jul	3:00	4:00	Unit 1	69.9°F	Night Video	0	6	1	4	0	0	0	0	0	0
Sun 28-Jul	4:00	5:00	Unit 1	69.4°F	Night Video	0	5	0	6	1	1	1	0	0	1
Sun 28-Jul					Sum Night		-22		-16	1		1		-1	
Sun 28-Jul	5:00	6:00	Unit 1	69.1°F	Day	13	8	7	1	0	0	0	0	0	1
Sun 28-Jul	6:00	7:00	Unit 1	69.2°F	Day	23	6	9	3	1	0	3	0	0	0
Sun 28-Jul	7:00	8:00	Unit 1	69.3°F	Day	63	12	33	7	3	0	9	0	5	3
Sun 28-Jul	8:00	9:00	Unit 1	69.3°F	Day	46	13	19	3	2	1	6	2	2	0
Sun 28-Jul	9:00	10:00	Unit 1	69.2°F	Day	24	5	24	4	1	0	1	0	4	1
Sun 28-Jul	10:00	11:00	Unit 1	69.3°F	Day	31	12	26	4	8	3	6	1	3	0
Sun 28-Jul	11:00	12:00	Unit 1	69.5°F	Day	34	14	22	9	1	0	7	0	5	1
Sun 28-Jul	12:00	13:00	Unit 1	69.2°F	Day	25	18	10	6	4	1	4	0	1	0
Sun 28-Jul					Sum 0500-1300		171		113	15		33		14	
Sun 28-Jul	13:00	14:00	Unit 1	69.4°F (trap)	Day	19	26	8	14	3	0	3	1	2	0
Sun 28-Jul	14:00	15:00	Unit 1	69.6°F (trap)	Day	26	32	12	7	2	0	5	0	4	0
Sun 28-Jul	15:00	16:00	Unit 1	69.3°F (trap)	Day	14	27	7	4	3	0	3	0	2	0
Sun 28-Jul	16:00	17:00	Unit 1	69.3°F (trap)	Day	15	13	9	2	2	1	5	0	1	0
Sun 28-Jul	17:00	18:00	Unit 1	69.4°F (trap)	Day	17	15	9	5	3	0	5	0	6	0
Sun 28-Jul	18:00	19:00	Unit 1	69.3°F (trap)	Day	11	10	5	5	1	0	1	0	3	1
Sun 28-Jul	19:00	20:00	Unit 1	69.3 °F (trap)	Day	4	11	5	2	2	1	1	1	5	2
Sun 28-Jul	20:00	21:00	Unit 1	69.3°F (trap)	Day	5	7	2	3	1	0	4	0	0	0
Sun 28-Jul					Sum 1300-2100		-30		15	15		25		20	
Sun 28-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				169		154	36		70		41	
Sun 28-Jul	21:00	22:00	Unit 1	69.4°F (trap)	Night Video	0	3	2	2	1	0	2	0	1	2
Sun 28-Jul	22:00	23:00	Unit 1	69.2°F (trap)	Night Video	0	5	0	2	0	0	0		0	0
Sun 28-Jul	23:00	0:00	Unit 1	70.2°F (trap)	Night Video	3	5	0	2	0	0	0	1	1	0
Mon 29-Jul	0:00	1:00	Unit 1	70.2°F (trap)	Night Video	0	2	0	0	0	0	0	0	0	1
Mon 29-Jul	1:00	2:00	Unit 1	70.1°F (trap)	Night Video	0	2	0	1	0	0	0	0	0	0
Mon 29-Jul	2:00	3:00	Unit 1	70.4°F (trap)	Night Video	0	2	0	1	0	0	1	0	0	0
Mon 29-Jul	3:00	4:00	Unit 1	70.4°F (trap)	Night Video	0	3	0	0	0	0	0	0	0	0
Mon 29-Jul	4:00	5:00	Unit 1	70.6°F (trap)	Night Video	1	4	0	1	0	0	0	0	0	0
Mon 29-Jul					Sum Night		-22		-7	1		2		-1	
Mon 29-Jul	5:00	6:00	Unit 1	70.5°F (trap)	Day	1	4	1	0	0	1	1	0	0	0
Mon 29-Jul	6:00	7:00	Unit 1	70.4°F (trap)	Day	11	9	1	4	4	0	7	0	0	0
Mon 29-Jul	7:00	8:00	Unit 1	70.5°F (trap)	Day	8	13	2	0	3	3	6	2	0	0
Mon 29-Jul	8:00	9:00	Unit 1	70.7°F (trap)	Day	12	7	9	7	5	4	1	0	1	0
Mon 29-Jul	9:00	10:00	Unit 1	70.9°F (trap)	Day	10	5	2	0	0	0	5	1	0	1
Mon 29-Jul	10:00	11:00	Unit 1	70.8°F (trap)	Day	7	4	5	2	4	2	4	2	1	0
Mon 29-Jul	11:00	12:00	FOP Unit 2	70.8°F (trap)	Day	8	7	5	4	3	0	1	0	0	0
Mon 29-Jul	12:00	13:00	FOP Unit 2	70.5°F (trap)	Day	4	3	1	1	5	0	0	0	1	0
Mon 29-Jul					Sum 0500-1300		9		8	14		20		2	
Mon 29-Jul	13:00	14:00	FOP Unit 2	70.8°F (trap)	Day	15	16	2	3	0	0	4	0	0	1
Mon 29-Jul	14:00	15:00	FOP Unit 2	70.5°F	Day	14	13	0	0	3	1	3	0	0	0
Mon 29-Jul	15:00	16:00	FOP Unit 2	70.6°F	Day	1	2	0	0	1	1	1	0	0	0
Mon 29-Jul	16:00	17:00	FOP Unit 2	71.0°F	Day	0	1	1	3	0	0	3	0	0	0
Mon 29-Jul	17:00	18:00	FOP Unit 2	70.8°F	Day	6	3	0	0	2	0	2	0	0	0
Mon 29-Jul	18:00	19:00	FOP Unit 2	71.0°F	Day	2	2	0	1	1	0	1	1	1	0
Mon 29-Jul	19:00	20:00	FOP Unit 2	70.8°F	Day	5	9	0	0	1	0	0	1	0	0
Mon 29-Jul	20:00	21:00	FOP Unit 2	71.0°F	Day	2	2	0	0	0	0	0	1	0	0
Mon 29-Jul					Sum 1300-2100		-3		-4	6		11		0	
Mon 29-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				7		5	24		37		2	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Mon 29-Jul	21:00	22:00	FOP Unit 2	71.0°F	Night Video	0	3	0	1	0	0	0	0	0	1
Mon 29-Jul	22:00	23:00	FOP Unit 2	71.0°F	Night Video	0	1	0	0	0	0	0	0	0	0
Mon 29-Jul	23:00	0:00	FOP Unit 2	71.0°F	Night Video	2	3	0	0	0	0	0	0	0	0
Tue 30-Jul	0:00	1:00	FOP Unit 2	70.8°F	Night Video	1	0	0	0	0	0	0	1	0	0
Tue 30-Jul	1:00	2:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	2:00	3:00	FOP Unit 2	70.4°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 30-Jul	3:00	4:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	4:00	5:00	FOP Unit 2	70.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Tue 30-Jul					Sum Night		-4		-1	0		-1		-1	
Tue 30-Jul	5:00	6:00	FOP Unit 2	70.5°F	Day	4	4	0	0	1	0	0	0	0	0
Tue 30-Jul	6:00	7:00	FOP Unit 2	70.6°F	Day	1	0	1	0	0	0	2	0	0	0
Tue 30-Jul	7:00	8:00	FOP Unit 2	70.7°F	Day	4	0	2	0	3	0	2	0	0	0
Tue 30-Jul	8:00	9:00	FOP Unit 2	70.5°F	Day	5	1	2	1	3	0	3	0	1	0
Tue 30-Jul	9:00	10:00	FOP Unit 2	70.2°F	Day	0	1	3	0	1	0	4	0	0	0
Tue 30-Jul	10:00	11:00	FOP Unit 2	70.1°F	Day	3	1	1	0	2	0	4	0	1	0
Tue 30-Jul	11:00	12:00	FOP Unit 2	70.0°F	Day	2	3	2	1	0	0	0	0	0	0
Tue 30-Jul	12:00	13:00	FOP Unit 2	70.4°F	Day	3	4	2	2	2	0	3	0	0	0
Tue 30-Jul					Sum 0500-1300	8		9		12		18		2	
Tue 30-Jul	13:00	14:00	FOP Unit 2	70.5°F	Day	2	5	8	2	1	1	2	0	0	0
Tue 30-Jul	14:00	15:00	FOP Unit 2	70.7°F	Day	5	2	2	2	0	0	1	0	0	0
Tue 30-Jul	15:00	16:00	FOP Unit 2	70.8°F	Day	9	9	3	1	1	0	1	0	0	0
Tue 30-Jul	16:00	17:00	FOP Unit 2	70.6°F	Day	7	3	3	4	3	0	2	0	0	0
Tue 30-Jul	17:00	18:00	FOP Unit 2	71.0°F	Day	6	5	1	1	2	0	2	1	0	0
Tue 30-Jul	18:00	19:00	FOP Unit 2	70.7°F	Day	7	9	0	1	0	0	1	0	0	0
Tue 30-Jul	19:00	20:00	FOP Unit 2	70.6°F	Day	0	0	0	1	1	0	1	0	0	0
Tue 30-Jul	20:00	21:00	FOP Unit 2	70.5°F	Day	2	2	0	0	0	0	1	0	0	0
Tue 30-Jul					Sum 1300-2100	3		5		7		10		0	
Tue 30-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			13		17		23		34		2	
Tue 30-Jul	21:00	22:00	FOP Unit 2	70.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	22:00	23:00	FOP Unit 2	70.8°F	Night Video	0	0	0	0	0	0	1	0	0	0
Tue 30-Jul	23:00	0:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	0:00	1:00	FOP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	1:00	2:00	FOP Unit 2	70.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	2:00	3:00	FOP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 31-Jul	3:00	4:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	4:00	5:00	FOP Unit 2	70.3°F	Night Video	1	1	0	1	0	0	0	0	0	0
Wed 31-Jul					Sum Night	0		-1		0		2		0	
Wed 31-Jul	5:00	6:00	FOP Unit 2	70.1°F	Day	1	1	2	0	0	0	1	0	0	0
Wed 31-Jul	6:00	7:00	FOP Unit 2	69.9°F	Day	6	2	2	0	6	2	2	0	0	0
Wed 31-Jul	7:00	8:00	FOP Unit 2	70.4°F	Day	5	2	2	0	8	1	7	0	0	0
Wed 31-Jul	8:00	9:00	FOP Unit 2	71.9°F	Day	8	0	1	0	1	0	2	0	0	0
Wed 31-Jul	9:00	10:00	FOP Unit 2	70.9°F	Day	2	0	0	0	0	0	0	0	0	0
Wed 31-Jul	10:00	11:00	FOP Unit 2	70.9°F	Day	6	3	2	1	3	0	3	1	0	0
Wed 31-Jul	11:00	12:00	Unit 1	71.1°F	Day	2	0	0	0	0	0	3	0	0	0
Wed 31-Jul	12:00	13:00	Unit 1	72.0°F	Day	3	5	1	0	2	2	2	0	0	0
Wed 31-Jul					Sum 0500-1300	20		9		15		19		0	
Wed 31-Jul	13:00	14:00	Unit 1	71.9°F	Day	6	6	2	2	1	0	3	1	0	0
Wed 31-Jul	14:00	15:00	Unit 1	71.6°F	Day	5	7	6	2	12	6	5	2	0	0
Wed 31-Jul	15:00	16:00	Unit 1	71.1°F	Day	14	16	8	3	0	0	2	0	1	0
Wed 31-Jul	16:00	17:00	Unit 1	70.8°F	Day	10	4	15	4	5	1	9	2	0	0
Wed 31-Jul	17:00	18:00	Unit 1	70.8°F	Day	13	9	6	4	0	0	3	0	0	0
Wed 31-Jul	18:00	19:00	Unit 1	70.9°F	Day	1	6	1	1	1	1	1	0	0	0
Wed 31-Jul	19:00	20:00	Unit 1	70.8°F	Day	4	5	3	2	2	0	3	1	1	0
Wed 31-Jul	20:00	21:00	Unit 1	70.7°F	Day	6	5	2	1	0	0	0	0	0	0
Wed 31-Jul					Sum 1300-2100	1		24		13		20		2	
Wed 31-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			25		40		34		47		2	

Date	Start Time	End Time	Unit	Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
							Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Wed 31-Jul	21:00	22:00	Unit 1		70.9°F	Night Video	2	5	0	0	0	1	0	0	0	0
Wed 31-Jul	22:00	23:00	Unit 1		70.8°F	Night Video	0	2	0	0	0	0	0	0	0	0
Wed 31-Jul	23:00	0:00	Unit 1		70.8°F	Night Video	0	0	0	0	0	1	0	0	0	0
Thu 01-Aug	0:00	1:00	Unit 1		70.8°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug	1:00	2:00	Unit 1		70.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug	2:00	3:00	Unit 1		71.1°F	Night Video	0	0	0	1	0	0	0	0	0	0
Thu 01-Aug	3:00	4:00	Unit 1		70.7°F	Night Video	0	0	0	1	0	0	0	0	0	0
Thu 01-Aug	4:00	5:00	Unit 1		70.8°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug						Sum Night		-5		-2		-2		0		0
Thu 01-Aug	5:00	6:00	Unit 1		70.8°F	Day	0	1	0	0	0	0	1	0	0	0
Thu 01-Aug	6:00	7:00	Unit 1		70.6°F	Day	17	1	9	5	2	0	3	1	0	0
Thu 01-Aug	7:00	8:00	Unit 1		70.5°F	Day	9	3	6	3	2	0	5	0	0	0
Thu 01-Aug	8:00	9:00	Unit 1		70.0°F	Day	13	7	17	7	5	0	5	1	2	0
Thu 01-Aug	9:00	10:00	Unit 1		70.7°F	Day	23	11	13	1	3	0	2	0	3	0
Thu 01-Aug	10:00	11:00	Unit 1		70.4°F	Day	24	12	19	7	7	0	5	0	1	0
Thu 01-Aug	11:00	12:00	Unit 1		70.7°F	Day	24	8	11	3	6	1	7	0	1	0
Thu 01-Aug	12:00	13:00	Unit 1		70.8°F	Day	25	34	18	13	4	1	9	1	2	1
Thu 01-Aug						Sum 0500-1300		58		54		27		34		8
Thu 01-Aug	13:00	14:00	Unit 1		71.0°F	Day	24	24	13	10	3	0	4	0	2	2
Thu 01-Aug	14:00	15:00	Unit 1		70.8°F	Day	14	12	16	7	8	5	4	1	0	1
Thu 01-Aug	15:00	16:00	Unit 1		70.6°F	Day	6	12	12	8	0	0	4	0	2	0
Thu 01-Aug	16:00	17:00	Unit 1		70.0°F	Day	8	8	2	1	1	0	8	2	4	0
Thu 01-Aug	17:00	18:00	Unit 1		70.2°F	Day	13	11	3	5	2	0	1	1	2	0
Thu 01-Aug	18:00	19:00	Unit 1		70.0°F	Day	5	6	5	0	0	1	0	0	1	0
Thu 01-Aug	19:00	20:00	Unit 1		69.6°F	Day	5	7	0	0	0	0	2	0	3	0
Thu 01-Aug	20:00	21:00	Unit 1		69.8°F	Day	1	2	1	0	1	0	0	1	2	3
Thu 01-Aug						Sum 1300-2100		-6		21		9		18		10
Thu 01-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2		62		90		43		62		22
Thu 01-Aug	21:00	22:00	Unit 1		70.0°F	Night Video										
Thu 01-Aug	22:00	23:00	Unit 1		70.3°F	Night Video										
Thu 01-Aug	23:00	0:00	Unit 1		70.4°F	Night Video										
Fri 02-Aug	0:00	1:00	Unit 1		70.1°F	Night Video										
Fri 02-Aug	1:00	2:00	Unit 1		70.6°F	Night Video										
Fri 02-Aug	2:00	3:00	Unit 1		70.3°F	Night Video										
Fri 02-Aug	3:00	4:00	Unit 1		69.8°F	Night Video										
Fri 02-Aug	4:00	5:00	Unit 1		69.8°F	Night Video										
Fri 02-Aug						Sum Night		0		0		0		0		0
Fri 02-Aug	5:00	6:00	Unit 1		69.5°F	Day	2	3	0	1	0	0	0	0	0	0
Fri 02-Aug	6:00	7:00	Unit 1		69.5°F	Day	11	3	4	1	5	1	0	0	0	0
Fri 02-Aug	7:00	8:00	Unit 1		69.5°F	Day	18	10	16	7	2	0	0	0	0	0
Fri 02-Aug	8:00	9:00	Unit 1		67.4°F	Day	22	12	10	7	1	0	0	0	0	0
Fri 02-Aug	9:00	10:00	Unit 1			Day										
Fri 02-Aug	10:00	11:00	Unit 1			Day										
Fri 02-Aug	11:00	12:00	Unit 1			Day										
Fri 02-Aug	12:00	13:00	Unit 1			Day										
Fri 02-Aug						Sum 0500-1300		25		14		7		0		0
Fri 02-Aug	13:00	14:00	Unit 1			Day										
Fri 02-Aug	14:00	15:00	Unit 1			Day										
Fri 02-Aug	15:00	16:00	Unit 1			Day										
Fri 02-Aug	16:00	17:00	Unit 1			Day										
Fri 02-Aug	17:00	18:00	Unit 1			Day										
Fri 02-Aug	18:00	19:00	Unit 1			Day										
Fri 02-Aug	19:00	20:00	Unit 1			Day										
Fri 02-Aug	20:00	21:00	Unit 1			Day										
Fri 02-Aug						Sum 1300-2100		0		0		0		0		0
Fri 02-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2		30		17		8		0		0

LWG Adult Ladder Exit Temp (°F), 22 JUL 17:00 – 2 AUG 08:00



Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

August 2, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference call was chaired and facilitated by Doug Baus, COE. Representatives of the COE, BPA, Oregon, NOAA, BOR, CRITFC/Umatilla, Washington, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lower Granite Dam Operations for Adult Ladder Temperature Issues

Today's call was the sixth in a series of TMT conference calls regarding adult passage at Lower Granite Dam. The purpose of today's meeting was for TMT to review the effects of the Unit 1 priority operation at Lower Granite on temperatures in the adult ladder and corresponding adult passage counts, particularly sockeye.

The Unit 1 priority operation has been in effect since July 31, when the Salmon Managers advised the Action Agencies to switch to Unit 1 priority through midnight August 5. From July 29 to July 31, Lower Granite operated at Unit 2 priority (FPP) per the Salmon Managers' recommendation.

Baus gave an update on conditions at the project. As of 9 am today, Unit 1 was discharging 17 kcfs and the RSW was spilling 6.9 kcfs. Updated adult passage counts as of this morning are posted to today's agenda. Attachment 2a shows that on August 1, 22 adult sockeye, 62 wild steelhead, 43 clipped steelhead, and 62 chinook adults passed Lower Granite Dam.

Attachment 2b is a graph of ladder exit temperatures through 8 am today. It shows a continued downward trend in temperatures at the Lower Granite ladder exit, from 72 degrees F at 9 am, August 1, to 67.4 degrees F at 9 am this morning. There was a 24-hour gap in ladder exit hourly temperature readings from 1 pm, July 28, to 1 pm, July 29, that was replaced by temperature data from the adult trap for that 24-hour period, Lisa Wright, COE, said. Temperatures between the two sites have been within $\pm 0.2^{\circ}\text{F}$ of each other on average. This 24-hour period is noted on the graph, and also notes the point on July 25 when the COE installed emergency auxiliary pumps.

Ann Setter, COE Walla Walla, gave an update on conditions at the project. The forecast over the next few days is for thunderstorms, which could provide an opportunity to turn off the auxiliary pumps if the Salmon Managers want to make another attempt to trap and haul adult sockeye upstream to the Eagle Hatchery. She suggested continued operation of Unit 1 whether or not the pumps are

turned off. Baus asked the region to consider the tradeoffs involved in turning off the auxiliary pumps and allowing ladder temperatures to rise again in order to operate the adult trap.

Setter asked the Salmon Managers to consider whether they would like the trap to operate on August 4 without the auxiliary pumps as a test of the temperature effects of pumping. FPAC could then decide on August 5 whether or not to operate the trap. The auxiliary pumps are currently providing temperatures of 66-67 degrees F at the ladder exit. The consensus on the July 31 FPAC call was to forego the transport operation in light of concerns about the effectiveness of transport, Paul Wagner, NOAA, said.

Discussion turned to the probability of continued RSW operation at Lower Granite. Baus reported there will likely be sufficient inflows to continue operation of the RSW because the current NWRFC forecast shows a slight (1 kcfs) increase in inflows. The current RFC forecast says inflows will remain above 25 kcfs for the next 10 days.

On July 31, TMT discussed the possibility of operating Unit 1 at approximately 16.5 kcfs rather than 17.0 kcfs (500 cfs reduction), which the COE agreed to investigate, Baus recalled. Unit 1 operates within the 1% best efficiency range but because of an operational limitation (fixed Kaplan blades) it is limited to operating within the 1% range at the upper end (fixed at approximately 17 kcfs). Based on some preliminary feedback from COE staff, implementing this request could be possible but it would likely have adverse operational impacts (possible vibration) on unit 1. At this time the COE does not believe the possible operations and maintenance costs associated with operating unit 1 below its currently modified lower limit of 17.0 kcfs would outweigh the benefits of slight reduction in the lower limit down to 16.5 kcfs.

In light of the increasing inflow forecast, we don't need to pursue that option, Charles Morrill, **Washington**, said. More risk assessment is needed but it doesn't sound like a prudent operation at this point, Russ Kiefer, **Idaho**, agreed. Tom Lorz, **Umatilla**, agreed that operating Unit 1 at the low end of 1% does not appear to be a prudent operation because it puts a higher percentage of juveniles through the Lower Granite bypass and turbines rather than the spillway. Based on this feedback the COE will not implement the unit 1 flow rate reduction in the short term but regarding the long term operation of unit 1 the COE will investigate if a downward adjustment in flow could be made on unit 1.

In light of current conditions, the Action Agencies proposed to continue the Unit 1 priority operation and auxiliary water supply to the fishway through the coming weekend, and possibly until August 10 when the Lower Granite Dam roof repair will begin. The COE will post weekend passage and temperature data for Lower Granite to the TMT webpage by 10 am Monday, August 5. TMT will then

meet at 2 pm Monday for further decision-making regarding adult passage conditions at Lower Granite. There were no objections to this operation.

3. *Spill at Little Goose Dam*

This item was added to today's agenda at the request of Scott Bettin, BPA. Flows are low enough that it's not possible to continue spilling 30% at Little Goose per the FOP. Spill volume, which has been limited to 9 kcfs for a while, needs to be further reduced tonight. The current spill rate at Little Goose is 35-36%, which raises concerns about fish passage and TDG levels. With this update, the COE will reduce spill at Little Goose from 9 kcfs to 7 kcfs, effective today.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Tony Norris	BPA
John Roache	BOR
Jim Litchfield	Montana
Scott Bettin	BPA
Sheri Sears	Colville
Barry Espenson	CBB
Paul Wagner	NOAA
Steve Hall	COE
Erick Van Dyke	Oregon
Tom Lorz	CRITFC/Umatilla
Margaret Filardo	FPC
Brandon Chockley	FPC
Charles Morrill	Washington
Ann Setter	COE Walla Walla
Greg Moody	COE Walla Walla
Russ Kiefer	Idaho
Heather Dohan	Puget
Dan Baker	IDFG
Laura Hamilton	COE
Bill Proctor	COE
Lisa Wright	COE
Dan Feil	COE
Steve Hall	COE Walla Walla

TECHNICAL MANAGEMENT TEAM

NOAA:	<i>Paul Wagner / Richard Domingue</i>	USFWS:	<i>David Wills / Steve Haeseker</i>
OR:	<i>Erick Van Dyke</i>	ID:	<i>Russ Kiefer / Pete Hassemer</i>
WA:	<i>Charles Morrill</i>	MT:	<i>Jim Litchfield / Brian Marotz</i>
Kootenai:	<i>Sue Ireland / Billy Barquin</i>	Spokane:	<i>Andy Miller</i>
Colville:	<i>Sheri Sears / Keith Wolf</i>	Nez Perce:	<i>Dave Statler</i>
Umatilla:	<i>Tom Lorz (CRITFC)</i>	Salish-Kootenai:	<i>Stu Levit</i>
BPA:	<i>Tony Norris / Scott Bettin / Robyn MacKay</i>	BOR:	<i>John Roache / Mary Mellema / Pat McGrane</i>
COE:	<i>Doug Baus / Karl Kanbergs</i>		

TMT CONFERENCE CALL

Monday, August 5, 2013 2:00pm - 3:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 7305

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**We have had disruptions when people do not mute their phones.
Please MUTE your phone.**

*All members are encouraged to contact Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Lower Granite Dam Operations for Adult Ladder Temperature Issues - *Doug Baus, COE NWD / Ann Setter, COE NWW / Russ Kiefer, Idaho*
 - a. updated Mon, 5 Aug 13:45 - LWG Adult Passage Counts and Ladder Temperature Hourly Data. [\[PDF\]](#) [\[Excel\]](#)
 - b. updated Mon, 5 Aug 9:00 - [LWG Adult Ladder Exit Temperature Graph.](#)
3. Other
 - a. Set agenda and date for next meeting - **August 7, 2013**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 22, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.50	11.80	13.40	735.42	633.09	102.33				735.46
2		1	27.20	11.80	13.50	735.45	633.29	102.16				735.46
3		1	25.60	11.80	13.50	735.46	633.07	102.39				735.46
4		2	25.70	11.90	13.50	735.47	633.03	102.44				735.46
5		1	25.70	11.90	13.50	735.48	633.09	102.39				735.46
6		1	25.80	12.00	13.60	735.54	633.05	102.49				735.46
7		1	25.80	11.90	13.60	735.58	632.97	102.61				735.46
8		1	30.70	12.00	18.30	735.50	633.50	102.00				735.46
9		1	30.70	12.00	18.50	735.51	633.36	102.15				735.46
10		1	30.60	11.90	18.50	735.48	633.44	102.04				735.46
11		1	30.80	12.00	18.50	735.43	633.50	101.93				735.46
12		1	30.80	12.00	18.50	735.43	633.47	101.96				735.52
13		1	28.70	11.90	16.50	735.42	633.25	102.17				735.52
14		1	28.60	11.80	16.50	735.36	633.26	102.10				735.52
15		2	28.50	11.80	16.50	735.36	633.22	102.14				735.52
16		2	28.60	11.80	16.50	735.39	633.29	102.10				735.52
17		2	25.80	15.00	10.50	735.40	633.34	102.06				735.52
18		1	24.00	16.80	6.90	735.40	633.32	102.08				735.51
19		1	24.00	16.90	6.90	735.45	633.38	102.07				735.51
20		1	24.10	16.90	6.90	735.47	633.25	102.22				735.51
21		1	24.10	16.90	6.90	735.52	633.27	102.25				735.51
22		1	25.80	16.90	6.90	735.55	633.48	102.07				735.51
23		1	24.00	16.90	6.90	735.59	633.26	102.33				735.51
24		1	24.00	16.90	6.90	735.60	633.21	102.39				735.51
TOT		35										
AVG		1	26.88	13.48	12.99	735.47	633.27	102.20				735.49
MAX			30.80	16.90	18.50	735.60	633.50	102.61				735.52
MIN			24.00	11.80	6.90	735.36	632.97	101.93				735.46

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM	Tuesday July 23, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.70	16.80	6.90	735.63	633.56	102.07				735.51
2		1	24.00	16.80	6.90	735.65	633.20	102.45				735.51
3		1	24.20	16.90	7.10	735.66	633.27	102.39				735.51
4		1	27.30	16.90	10.10	735.67	633.24	102.43				735.51
5		1	27.50	17.00	10.20	735.71	632.92	102.79				735.51
6		1	27.50	16.90	10.30	735.72	633.16	102.56				735.51
7		1	27.40	16.90	10.30	735.75	633.11	102.64				735.51
8		1	27.90	17.30	10.40	735.72	633.00	102.72				735.51
9		2	27.30	11.90	15.10	735.77	633.09	102.68				735.74
10		1	27.20	11.80	15.10	735.78	633.07	102.71				735.74
11		1	27.20	11.80	15.10	735.76	633.10	102.66				735.74
12		1	27.00	11.60	15.10	735.77	633.12	102.65				735.74
13		1	27.20	11.70	15.20	735.72	633.08	102.64				735.74
14		2	26.90	11.60	15.10	735.75	633.10	102.65				735.74
15		2	27.10	11.70	15.00	735.71	633.15	102.56				735.74
16		2	28.70	11.60	15.10	735.70	633.26	102.44				735.74
17		2	27.20	11.70	15.10	735.72	633.07	102.65				735.74
18		1	27.10	11.70	15.20	735.74	633.10	102.64				735.74
19		1	26.70	11.20	15.20	735.71	633.12	102.59				735.74
20		1	30.30	5.00	25.00	735.65	633.13	102.52				735.74
21		1	30.60	5.00	25.30	735.62	633.12	102.50				735.74
22		1	30.40	5.00	25.10	735.57	633.11	102.46				735.74
23		1	30.30	5.00	25.00	735.54	633.23	102.31				735.74
24		1	28.20	5.00	22.90	735.54	633.30	102.24				735.74
TOT		35										
AVG		1	27.54	12.03	15.07	735.69	633.15	102.54				735.66
MAX			30.60	17.30	25.30	735.78	633.56	102.79				735.74
MIN			24.00	5.00	6.90	735.54	632.92	102.07				735.51

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG	LOWER GRANITE DAM	Wednesday July 24, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	28.20	5.00	22.90	735.52	633.33	102.19				735.74
2		1	28.00	5.00	22.70	735.52	633.35	102.17				735.74
3		1	27.90	5.00	22.60	735.53	633.37	102.16				735.74
4		1	28.00	5.00	22.70	735.52	633.43	102.09				735.74
5		1	28.10	5.00	22.80	735.52	633.37	102.15				735.74
6		1	29.60	7.00	22.30	735.51	633.43	102.08				735.74
7		1	26.90	16.90	9.60	735.56	633.52	102.04				735.74
8		1	27.20	17.00	10.00	735.54	633.43	102.11				735.74
9		1	27.40	17.10	10.00	735.56	633.61	101.95				735.74
10		1	27.40	17.10	10.00	735.58	633.48	102.10				735.74
11		1	27.40	17.10	10.00	735.56	633.24	102.32				735.74
12		1	27.30	17.10	9.90	735.56	633.38	102.18				735.74
13		1	29.00	17.10	9.90	735.58	633.36	102.22				735.74
14		1	27.10	17.00	9.80	735.54	633.09	102.45				735.74
15		2	27.20	17.10	9.90	735.54	633.21	102.33				735.74
16		1	27.30	17.00	10.00	735.57	633.20	102.37				735.74
17		1	27.30	17.00	10.00	735.59	633.25	102.34				735.74
18		1	26.90	16.40	10.20	735.58	633.17	102.41				735.74
19		1	28.70	5.00	23.40	735.56	633.19	102.37				735.74
20		1	28.70	5.00	23.40	735.54	633.22	102.32				735.74
21		1	28.70	5.00	23.40	735.52	633.29	102.23				735.74
22		2	28.70	5.00	23.40	735.50	633.26	102.24				735.74
23		1	28.70	5.00	23.40	735.47	633.32	102.15				735.74
24		1	28.70	5.00	23.40	735.48	633.39	102.09				735.74
TOT		35										
AVG		1	27.93	11.08	16.49	735.54	633.33	102.21				735.74
MAX			29.60	17.10	23.40	735.59	633.61	102.45				735.74
MIN			26.90	5.00	9.60	735.47	633.09	101.95				735.74

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM Thursday July 25, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	28.60	5.00	23.30	735.46	633.32	102.14				735.74
2		1	28.50	5.00	23.20	735.44	633.37	102.07				735.74
3		1	28.50	5.00	23.20	735.43	633.31	102.12				735.74
4		1	28.50	5.00	23.20	735.42	633.38	102.04				735.74
5		1	26.40	5.00	21.10	735.41	633.31	102.10				735.74
6		1	26.60	5.00	21.30	735.37	633.40	101.97				735.74
7		1	27.50	16.60	10.60	735.39	633.50	101.89				735.74
8		2	27.60	17.10	10.20	735.38	633.48	101.90				735.74
9		2	27.60	17.10	10.10	735.37	633.57	101.80				735.74
10		2	29.20	17.00	10.10	735.35	633.21	102.14				735.74
11		2	28.60	18.20	10.10	735.34	633.47	101.87				735.74
12		2	27.30	17.00	10.00	735.35	633.49	101.86				735.74
13		2	27.30	17.00	10.00	735.29	633.24	102.05				735.74
14		2	27.30	17.00	10.00	735.28	633.43	101.85				735.74
15		2	33.60	23.40	9.90	735.24	633.73	101.51				735.74
16		2	27.20	17.00	9.90	735.23	633.30	101.93				735.74
17		2	27.30	17.20	9.90	735.21	633.35	101.86				735.49
18		2	27.70	17.50	9.90	735.05	633.29	101.76				735.49
19		2	22.40	12.20	9.90	735.21	633.13	102.08				735.49
20		2	22.20	11.90	9.90	735.22	633.40	101.82				735.49
21		2	22.30	12.00	9.90	735.22	633.15	102.07				735.49
22		2	22.20	12.00	10.00	735.30	633.00	102.30				735.49
23		2	23.30	11.90	11.10	735.28	633.12	102.16				735.49
24		2	25.40	11.90	13.20	735.28	632.81	102.47				735.49
TOT		37										
AVG		2	26.80	13.08	13.33	735.31	633.32	101.99				735.66
MAX			33.60	23.40	23.30	735.46	633.73	102.47				735.74
MIN			22.20	5.00	9.90	735.05	632.81	101.51				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Friday July 26, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.30	11.90	13.10	735.32	632.72	102.60				735.49
2		2	25.40	12.00	13.10	735.31	632.99	102.32				735.49
3		2	27.00	11.90	13.10	735.26	632.89	102.37				735.49
4		2	25.30	11.80	13.20	735.30	632.60	102.70				735.49
5		2	25.60	11.90	13.30	735.33	632.84	102.49				735.49
6		2	25.50	11.80	13.40	735.38	632.74	102.64				735.49
7		2	29.60	11.90	17.30	735.35	633.16	102.19				735.49
8		2	30.70	12.10	18.30	735.39	633.24	102.15				735.49
9		2	30.60	11.90	18.30	735.40	633.11	102.29				735.49
10		2	30.60	12.00	18.30	735.35	633.30	102.05				735.49
11		2	30.50	11.90	18.30	735.35	633.28	102.07				735.49
12		2	30.40	11.90	18.20	735.35	633.29	102.06				735.49
13		2	30.50	12.00	18.20	735.28	633.46	101.82				735.49
14		2	30.60	12.00	18.30	735.28	633.44	101.84				735.49
15		2	30.50	12.00	18.20	735.24	633.44	101.80				735.49
16		2	30.50	12.10	16.50	735.24	633.07	102.17				735.49
17		1	23.60	12.00	11.30	735.24	633.24	102.00				735.49
18		1	23.50	11.90	11.30	735.22	633.39	101.83				735.49
19		2	23.60	12.00	11.30	735.25	633.07	102.18				735.49
20		2	23.60	12.00	11.30	735.28	633.22	102.06				735.49
21		2	23.60	12.00	11.30	735.25	633.35	101.90				735.49
22		2	23.70	12.10	11.20	735.29	633.15	102.14				735.49
23		2	23.50	11.90	11.20	735.33	633.16	102.17				735.49
24		2	23.40	11.90	11.20	735.34	633.37	101.97				735.49
TOT		38										
AVG		2	26.96	11.95	14.55	735.31	633.15	102.16				735.49
MAX			30.70	12.10	18.30	735.40	633.46	102.70				735.49
MIN			23.40	11.80	11.20	735.22	632.60	101.80				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM Saturday July 27, 2013							
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	LWSI GAGE ELEV
1		2	23.30	12.00	11.00	735.32	633.26	102.06				735.49
2		2	23.40	11.90	11.20	735.35	633.24	102.11				735.49
3		2	23.50	12.00	11.20	735.35	633.40	101.95				735.49
4		2	23.60	12.10	11.20	735.37	633.33	102.04				735.49
5		2	23.50	12.00	11.20	735.42	633.27	102.15				735.49
6		2	23.50	11.90	11.20	735.46	633.37	102.09				735.49
7		1	23.50	11.90	11.30	735.50	633.36	102.14				735.49
8		1	23.60	11.90	11.30	735.56	633.32	102.24				735.49
9		1	23.70	12.00	11.30	735.58	633.43	102.15				735.49
10		1	24.70	13.40	11.00	735.61	633.38	102.23				735.49
11		2	25.80	17.20	8.30	735.57	633.50	102.07				735.49
12		2	27.50	17.20	8.30	735.61	633.72	101.89				735.49
13		2	25.80	17.20	8.30	735.56	633.50	102.06				735.49
14		2	25.80	17.20	8.30	735.56	633.52	102.04				735.49
15		2	25.80	17.30	8.20	735.57	633.81	101.76				735.49
16		2	27.50	17.20	8.20	735.56	633.64	101.92				735.49
17		2	25.70	17.20	8.30	735.57	633.53	102.04				735.49
18		2	25.70	17.20	8.30	735.56	633.63	101.93				735.49
19		2	25.80	17.20	8.30	735.54	633.40	102.14				735.49
20		2	25.60	17.10	8.20	735.52	633.35	102.17				735.49
21		2	25.50	17.10	8.10	735.50	633.56	101.94				735.49
22		2	25.40	17.10	8.00	735.49	633.44	102.05				735.49
23		2	25.50	17.10	8.10	735.46	633.50	101.96				735.49
24		2	25.60	17.10	8.10	735.43	633.57	101.86				735.49
TOT		38										
AVG		2	24.97	15.06	9.45	735.50	633.46	102.04				735.49
MAX			27.50	17.30	11.30	735.61	633.81	102.24				735.49
MIN			23.30	11.90	8.00	735.32	633.24	101.76				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Sunday July 28, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.60	17.20	8.10	735.42	633.53	101.89				735.49
2		2	25.70	17.20	8.20	735.39	633.48	101.91				735.49
3		2	25.80	17.20	8.30	735.35	633.60	101.75				735.49
4		2	25.70	17.10	8.30	735.37	633.50	101.87				735.49
5		2	25.60	17.20	8.10	735.37	633.50	101.87				735.49
6		2	25.60	17.20	8.20	735.35	633.55	101.80				735.49
7		2	25.60	17.10	8.20	735.37	633.41	101.96				735.50
8		2	25.50	17.10	8.20	735.39	633.58	101.81				735.50
9		2	25.50	17.10	8.10	735.39	633.49	101.90				735.50
10		2	25.50	17.10	8.10	735.39	633.59	101.80				735.50
11		2	25.60	17.20	8.10	735.39	633.56	101.83				735.50
12		2	25.50	17.00	8.10	735.39	633.57	101.82				735.50
13		2	27.00	16.90	8.10	735.37	633.53	101.84				735.50
14		2	25.40	17.00	8.10	735.32	633.39	101.93				735.50
15		2	25.40	17.00	8.10	735.32	633.30	102.02				735.50
16		2	25.40	16.90	8.10	735.33	633.47	101.86				735.50
17		2	25.30	16.90	8.10	735.35	633.41	101.94				735.50
18		2	25.40	17.00	8.10	735.32	633.46	101.86				735.50
19		2	25.30	17.00	8.00	735.29	633.48	101.81				735.50
20		2	25.30	17.00	8.00	735.27	633.49	101.78				735.50
21		2	25.20	17.00	8.00	735.24	633.44	101.80				735.50
22		2	25.40	17.10	7.90	735.21	633.50	101.71				735.50
23		2	25.40	17.10	7.90	735.20	633.43	101.77				735.50
24		2	25.30	17.00	8.00	735.18	633.40	101.78				735.50
TOT		38										
AVG		2	25.54	17.07	8.10	735.33	633.49	101.85				735.50
MAX			27.00	17.20	8.30	735.42	633.60	102.02				735.50
MIN			25.20	16.90	7.90	735.18	633.30	101.71				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 29, 2013				
	GROSS GEN MW	STA USE MW	-----		OUTFLOW	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT STATUS		LWSI GAGE ELEV
			-- TOTAL	IN KCFS	-- SPILL	IN FEET + MSL	TAILWATR			ON ON		
											POWER	
1		2	25.40	17.00	8.00	735.15	633.46	101.69				735.50
2		2	25.50	17.10	8.10	735.10	633.36	101.74				735.50
3		2	24.90	17.00	7.60	735.10	633.41	101.69				735.50
4		2	24.20	17.10	6.80	735.08	633.50	101.58				735.50
5		2	24.30	17.20	6.80	735.07	633.43	101.64				735.50
6		2	24.30	17.10	6.80	735.08	633.43	101.65				735.48
7		2	24.30	17.20	6.80	735.11	633.44	101.67				735.48
8		2	24.30	17.10	6.80	735.14	633.41	101.73				735.48
9		2	24.10	17.00	6.80	735.18	633.35	101.83				735.48
10		2	24.30	17.10	6.80	735.21	633.27	101.94				735.48
11		2	24.20	17.10	6.90	735.22	633.31	101.91				735.48
12		2	20.80	11.70	7.40	735.31	633.38	101.93				735.49
13		2	21.40	11.40	7.90	735.32	633.44	101.88				735.49
14		2	19.80	11.40	8.10	735.33	633.50	101.83				735.50
15		2	20.60	12.20	8.10	735.39	633.36	102.03				735.50
16		2	20.50	12.10	8.10	735.43	633.40	102.03				735.50
17		2	20.50	12.30	7.90	735.45	633.44	102.01				735.49
18		2	20.40	12.10	8.00	735.49	633.34	102.15				735.53
19		2	20.50	12.20	8.00	735.50	633.37	102.13				
20		2	20.40	12.10	8.00	735.52	633.40	102.12				735.55
21		2	20.40	12.10	8.00	735.54	633.33	102.21				735.57
22		2	20.30	12.00	8.00	735.56	633.37	102.19				735.55
23		2	20.30	12.00	8.00	735.58	633.36	102.22				735.53
24		2	21.60	11.60	8.00	735.60	633.36	102.24				735.52
TOT		39										
AVG		2	22.39	14.30	7.57	735.31	633.39	101.92				735.50
MAX			25.50	17.20	8.10	735.60	633.50	102.24				735.57
MIN			19.80	11.40	6.80	735.07	633.27	101.58				735.48

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Tuesday July 30, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	19.80	11.50	8.00	735.61	633.37	102.24				735.55
2		2	20.10	11.70	8.00	735.64	633.36	102.28				735.57
3		2	20.00	11.60	8.10	735.69	633.37	102.32				735.58
4		2	20.10	11.70	8.10	735.72	633.37	102.35				735.64
5		2	20.00	11.60	8.10	735.78	633.39	102.39				735.70
6		2	24.10	11.60	12.20	735.79	632.89	102.90				735.80
7		2	25.70	11.50	13.90	735.82	632.76	103.06				735.80
8		2	25.70	11.60	13.90	735.86	632.80	103.06				735.81
9		2	25.70	11.60	13.80	735.85	632.86	102.99				735.84
10		2	25.90	11.70	13.90	735.86	632.84	103.02				735.86
11		2	27.30	12.90	14.10	735.88	632.80	103.08				735.82
12		2	26.20	11.50	14.50	735.80	632.96	102.84				735.81
13		2	27.20	11.30	15.50	735.81	633.00	102.81				735.87
14		2	27.20	11.40	15.50	735.79	633.00	102.79				735.82
15		2	27.40	11.50	15.60	735.76	633.07	102.69				735.81
16		2	27.40	11.60	15.50	735.71	633.07	102.64				735.79
17		2	29.00	11.60	15.30	735.70	633.17	102.53				735.72
18		2	27.20	11.60	15.30	735.67	633.14	102.53				735.69
19		2	27.20	11.60	15.30	735.56	633.14	102.42				735.66
20		2	27.00	11.40	15.30	735.60	633.39	102.21				735.59
21		2	27.30	11.70	15.30	735.52	633.17	102.35				735.56
22		2	27.10	11.60	15.20	735.48	633.14	102.34				735.52
23		2	28.30	11.60	14.70	735.46	633.22	102.24				735.51
24		2	23.90	11.60	12.00	735.43	633.17	102.26				735.51
TOT		40										
AVG		2	25.28	11.62	13.21	735.70	633.10	102.60				735.70
MAX			29.00	12.90	15.60	735.88	633.39	103.08				735.87
MIN			19.80	11.30	8.00	735.43	632.76	102.21				735.51

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Wednesday July 31, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	23.90	11.60	12.00	735.42	633.29	102.13				735.50
2		2	23.90	11.60	12.00	735.41	633.54	101.87				735.50
3		2	24.10	11.70	12.10	735.39	633.17	102.22				735.50
4		2	24.10	11.70	12.10	735.39	633.25	102.14				735.50
5		2	24.00	11.60	12.10	735.39	633.33	102.06				735.50
6		2	24.10	11.60	12.10	735.45	633.09	102.36				735.49
7		2	24.30	11.70	12.30	735.49	633.19	102.30				735.50
8		2	24.20	11.60	12.30	735.52	633.18	102.34				735.50
9		2	24.20	11.50	12.30	735.57	633.07	102.50				735.54
10		2	24.30	11.70	12.30	735.62	633.19	102.43				735.56
11		2	24.20	11.50	12.40	735.61	633.17	102.44				735.62
12		2	27.60	17.20	10.10	735.59	633.29	102.30				735.68
13		2	28.90	16.90	10.00	735.68	633.39	102.29				735.66
14		2	27.10	17.00	9.80	735.65	633.39	102.26				735.65
15		2	27.90	17.80	9.80	735.52	633.60	101.92				735.69
16		2	28.60	19.60	8.70	735.57	633.70	101.87				735.68
17		2	24.50	16.90	7.30	735.58	633.56	102.02				735.59
18		2	24.20	17.00	6.90	735.47	633.89	101.58				735.64
19		2	24.10	17.00	6.90	735.52	633.53	101.99				735.71
20		2	24.20	17.00	6.90	735.52	633.37	102.15				735.66
21		2	24.10	16.90	6.90	735.52	633.58	101.94				735.53
22		2	24.10	16.90	6.90	735.47	633.46	102.01				735.54
23		2	24.10	16.90	6.90	735.46	633.43	102.03				735.53
24		2	24.10	16.90	6.90	735.46	633.54	101.92				735.50
TOT		40										
AVG		2	24.95	14.66	9.92	735.51	633.38	102.13				735.57
MAX			28.90	19.60	12.40	735.68	633.89	102.50				735.71
MIN			23.90	11.50	6.90	735.39	633.07	101.58				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM Thursday August 1, 2013				
	GROSS GEN MW	STA USE MW	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT STATUS		LWSI GAGE ELEV
			--	IN KCFS	--	IN FEET +	MSL			ON	ON	
			TOTAL	POWER	SPILL	FOREBAY	TAILWATR			RMT	LINE	
1		2	24.00	16.90	6.90	735.45	633.46	101.99				735.50
2		2	24.10	16.90	6.90	735.43	633.53	101.90				735.50
3		2	24.10	16.90	6.90	735.43	633.57	101.86				735.50
4		2	24.10	16.90	6.90	735.41	633.52	101.89				735.50
5		2	24.10	16.90	6.90	735.39	633.58	101.81				735.51
6		2	24.10	16.90	6.90	735.39	633.55	101.84				735.51
7		2	24.10	16.90	6.90	735.43	633.44	101.99				735.51
8		2	24.00	16.80	6.90	735.47	633.44	102.03				735.50
9		2	25.80	16.90	6.90	735.35	633.43	101.92				735.55
10		2	23.90	16.80	6.90	735.51	633.34	102.17				735.55
11		2	24.10	16.90	6.90	735.59	633.55	102.04				735.52
12		2	24.10	16.90	6.90	735.58	633.48	102.10				735.62
13		2	24.10	16.90	6.90	735.65	633.43	102.22				735.64
14		2	24.10	16.90	6.90	735.64	633.68	101.96				735.65
15		2	24.10	17.00	6.90	735.58	633.49	102.09				735.72
16		2	24.00	16.90	6.90	735.61	633.53	102.08				735.74
17		2	24.10	16.90	6.90	735.63	633.75	101.88				735.71
18		2	24.10	16.90	6.90	735.63	633.50	102.13				735.66
19		2	24.10	16.90	6.90	735.64	633.60	102.04				735.60
20		2	24.00	16.90	6.90	735.63	633.75	101.88				735.61
21		2	24.10	16.90	6.90	735.61	633.44	102.17				735.60
22		2	24.10	16.90	6.90	735.63	633.61	102.02				735.60
23		2	24.10	17.00	6.90	735.63	633.76	101.87				735.56
24		2	24.20	17.00	6.90	735.58	633.66	101.92				735.59
TOT		39										
AVG		2	24.15	16.90	6.90	735.54	633.55	101.99				735.58
MAX			25.80	17.00	6.90	735.65	633.76	102.22				735.74
MIN			23.90	16.80	6.90	735.35	633.34	101.81				735.50

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM					
								Friday	August	2,	2013		
	GROSS	STA	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG	SUPR	UNIT	STATUS	LWSI	
	GEN	USE	--	IN KCFS	--	IN FEET + MSL	TAILWATR	HEAD	CAP	ON	ON		GAGE
MW	MW	TOTAL	POWER	SPILL	FOREBAY			FT	MW	RMT	LINE	AVL	ELEV
1		2	24.20	17.00	6.90	735.59	633.64	101.95					735.61
2		2	24.20	17.00	6.90	735.62	633.79	101.83					735.55
3		2	24.20	17.00	6.90	735.57	633.71	101.86					735.60
4		2	24.20	17.00	6.90	735.56	633.74	101.82					735.67
5		2	24.20	17.00	6.90	735.64	633.81	101.83					735.62
6		2	24.30	17.10	6.90	735.65	633.68	101.97					735.64
7		2	24.10	17.00	6.90	735.65	633.68	101.97					735.71
8		2	24.20	17.00	6.90	735.71	633.86	101.85					735.72
9		2	24.20	17.00	6.90	735.74	633.69	102.05					735.72
10		2	24.20	17.00	6.90	735.74	633.75	101.99					735.77
11		2	24.30	17.10	6.90	735.75	633.76	101.99					735.81
12		2	24.30	17.10	6.90	735.76	633.64	102.12					735.83
13		2	24.20	17.00	6.90	735.76	633.65	102.11					735.84
14		2	24.30	17.10	6.90	735.78	633.75	102.03					735.83
15		2	24.30	17.10	6.90	735.78	633.56	102.22					735.82
16		2	24.20	17.00	6.90	735.78	633.51	102.27					735.81
17		2	24.30	17.10	6.90	735.76	633.70	102.06					735.79
18		2	24.30	17.20	6.90	735.76	633.59	102.17					735.80
19		2	24.20	17.00	6.90	735.76	633.56	102.20					735.77
20		2	24.20	17.00	6.90	735.74	633.59	102.15					735.76
21		2	24.20	17.10	6.90	735.74	633.51	102.23					735.75
22		2	24.20	17.00	6.90	735.73	633.46	102.27					735.75
23		2	24.20	17.00	6.90	735.72	633.39	102.33					735.73
24		2	24.30	17.10	6.90	735.72	633.31	102.41					735.72
TOT		39											
AVG		2	24.23	17.04	6.90	735.71	633.64	102.07					735.73
MAX			24.30	17.20	6.90	735.78	633.86	102.41					735.84
MIN			24.10	17.00	6.90	735.56	633.31	101.82					735.55

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Saturday August 3, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	24.20	17.00	6.90	735.71	633.34	102.37				735.70
2		2	24.10	16.90	6.90	735.71	633.36	102.35				735.70
3		2	24.10	16.90	6.90	735.71	633.29	102.42				735.71
4		2	24.00	16.90	6.90	735.70	633.31	102.39				735.70
5		2	24.10	16.90	6.90	735.70	633.20	102.50				735.69
6		2	24.00	16.80	6.90	735.70	633.16	102.54				735.70
7		2	24.00	16.90	6.90	735.69	633.15	102.54				735.71
8		2	24.00	16.80	6.90	735.71	632.97	102.74				735.72
9		2	24.20	17.00	6.90	735.72	633.07	102.65				735.74
10		2	24.20	17.00	6.90	735.74	633.00	102.74				735.75
11		2	25.70	16.90	8.50	735.74	632.84	102.90				735.76
12		2	27.30	17.00	10.00	735.73	632.95	102.78				735.74
13		2	27.30	17.00	10.10	735.71	632.93	102.78				735.70
14		2	27.50	17.00	10.30	735.65	633.02	102.63				735.69
15		2	27.40	17.00	10.10	735.63	633.04	102.59				735.67
16		2	27.60	17.00	10.30	735.61	633.07	102.54				735.63
17		2	27.70	17.10	10.30	735.57	633.12	102.45				735.60
18		2	27.50	17.00	10.30	735.54	633.15	102.39				735.58
19		2	27.60	17.00	10.20	735.52	633.16	102.36				735.52
20		2	27.50	17.00	10.20	735.49	633.29	102.20				735.51
21		2	27.60	17.10	10.20	735.46	633.30	102.16				735.51
22		2	27.50	17.10	10.20	735.43	633.24	102.19				735.50
23		2	27.40	17.00	10.00	735.39	633.40	101.99				735.50
24		2	27.30	17.10	10.00	735.35	633.29	102.06				735.50
TOT		39										
AVG		2	25.99	16.98	8.74	735.62	633.15	102.47				735.65
MAX			27.70	17.10	10.30	735.74	633.40	102.90				735.76
MIN			24.00	16.80	6.90	735.35	632.84	101.99				735.50

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Sunday August 4, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	27.30	17.10	10.00	735.35	633.26	102.09				735.50
2		2	26.70	17.00	9.40	735.35	633.40	101.95				735.49
3		2	24.20	17.00	6.90	735.35	633.35	102.00				735.50
4		2	24.10	17.00	6.90	735.34	633.40	101.94				735.50
5		2	24.10	17.00	6.90	735.35	633.37	101.98				735.49
6		2	24.10	16.90	6.90	735.37	633.43	101.94				735.50
7		2	24.10	17.00	6.90	735.37	633.50	101.87				735.50
8		2	24.10	17.00	6.90	735.38	633.43	101.95				735.50
9		2	24.10	17.00	6.90	735.42	633.42	102.00				735.50
10		2	24.10	16.90	6.90	735.42	633.50	101.92				735.49
11		2	24.10	16.90	6.90	735.46	633.43	102.03				735.50
12		2	24.20	17.00	6.90	735.50	633.49	102.01				735.49
13		2	24.30	17.10	6.90	735.52	633.55	101.97				735.50
14		2	24.30	17.10	6.90	735.54	633.50	102.04				735.52
15		2	24.20	17.10	6.90	735.56	633.53	102.03				735.55
16		2	24.30	17.10	6.90	735.56	633.54	102.02				735.56
17		2	24.30	17.10	6.90	735.56	633.53	102.03				735.58
18		2	24.20	17.00	6.90	735.56	633.50	102.06				735.58
19		2	24.30	17.10	6.90	735.57	633.53	102.04				735.58
20		2	24.20	17.10	6.90	735.57	633.43	102.14				735.60
21		2	24.20	17.10	6.90	735.57	633.58	101.99				735.59
22		2	24.20	17.10	6.90	735.57	633.59	101.98				735.59
23		2	26.00	17.10	6.90	735.50	633.37	102.13				735.59
24		2	24.20	17.10	6.90	735.59	633.56	102.03				735.58
TOT		39										
AVG		2	24.50	17.04	7.13	735.47	633.47	102.01				735.53
MAX			27.30	17.10	10.00	735.59	633.59	102.14				735.60
MIN			24.10	16.90	6.90	735.34	633.26	101.87				735.49

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down		Chinook jack Up Down		Steelhead clipped Up Down		Steelhead wild Up Down		Sockeye Up Down	
Mon 22-Jul	5:00	6:00	FOP Unit 2	73.3°F	Day	n/a		n/a		n/a		n/a		n/a	
Mon 22-Jul	6:00	7:00	FOP Unit 2	73.7°F	Day										
Mon 22-Jul	7:00	8:00	FOP Unit 2	73.9°F	Day										
Mon 22-Jul	8:00	9:00	FOP Unit 2	74.0°F	Day										
Mon 22-Jul	9:00	10:00	FOP Unit 2	74.0°F	Day										
Mon 22-Jul	10:00	11:00	FOP Unit 2	75.0°F	Day										
Mon 22-Jul	11:00	12:00	FOP Unit 2	75.1°F	Day										
Mon 22-Jul	12:00	13:00	FOP Unit 2	75.4°F	Day										
Mon 22-Jul				Sum 0500-1300											
Mon 22-Jul	13:00	14:00	FOP Unit 2	75.1°F	Day										
Mon 22-Jul	14:00	15:00	FOP Unit 2	74.8°F	Day	n/a		n/a		n/a		n/a		n/a	
Mon 22-Jul	15:00	16:00	FOP Unit 2	74.5°F	Day										
Mon 22-Jul	16:00	17:00	FOP Unit 2	75.2°F	Day										
Mon 22-Jul	17:00	18:00	Unit 1	75.2°F	Day										
Mon 22-Jul	18:00	19:00	Unit 1	74.1°F	Day										
Mon 22-Jul	19:00	20:00	Unit 1	73.3°F	Day	n/a		n/a		n/a		n/a		n/a	
Mon 22-Jul	20:00	21:00	Unit 1	73.1°F	Day										
Mon 22-Jul				Sum 1300-2100											
Mon 22-Jul	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					20		11		16		10		6	
Mon 22-Jul	21:00	22:00	Unit 5 (5k)	72.3°F	Night Video	n/a		n/a		n/a		n/a		n/a	
Mon 22-Jul	22:00	23:00	Unit 5 (5k)	72.3°F	Night Video										
Mon 22-Jul	23:00	0:00	Unit 5 (5k)	72.9°F	Night Video										
Tue 23-Jul	0:00	1:00	Unit 5 (5k)	72.4°F	Night Video										
Tue 23-Jul	1:00	2:00	Unit 5 (5k)	71.8°F	Night Video										
Tue 23-Jul	2:00	3:00	Unit 5 (5k)	72.2°F	Night Video										
Tue 23-Jul	3:00	4:00	Unit 5 (5k)	72.5°F	Night Video										
Tue 23-Jul	4:00	5:00	Unit 5 (5k)	72.5°F	Night Video										
Tue 23-Jul				Sum Night											
Tue 23-Jul	5:00	6:00	Unit 1	72.6°F	Day	8	0	6	0	0	0	0	0	0	0
Tue 23-Jul	6:00	7:00	Unit 1	72.8°F	Day	20	17	12	9	1	1	1	0	0	0
Tue 23-Jul	7:00	8:00	Unit 1	73.0°F	Day	29	24	33	14	7	1	3	1	1	0
Tue 23-Jul	8:00	9:00	FOP Unit 2	73.1°F	Day	17	20	23	28	2	1	1	0	0	0
Tue 23-Jul	9:00	10:00	FOP Unit 2	73.3°F	Day	4	5	1	7	1	3	1	1	0	0
Tue 23-Jul	10:00	11:00	FOP Unit 2	73.8°F	Day	7	14	2	0	2	0	1	1	0	0
Tue 23-Jul	11:00	12:00	FOP Unit 2	74.3°F	Day	2	5	0	0	0	1	0	0	0	1
Tue 23-Jul	12:00	13:00	FOP Unit 2	74.3°F	Day	5	5	0	2	6	2	2	0	1	0
Tue 23-Jul				Sum 0500-1300		2		17		10		6		1	
Tue 23-Jul	13:00	14:00	FOP Unit 2	74.3°F	Day	n/a		n/a		n/a		n/a		n/a	
Tue 23-Jul	14:00	15:00	FOP Unit 2	73.9°F	Day										
Tue 23-Jul	15:00	16:00	FOP Unit 2	73.9°F	Day										
Tue 23-Jul	16:00	17:00	FOP Unit 2	74.1°F	Day										
Tue 23-Jul	17:00	18:00	FOP Unit 2	75.1°F	Day										
Tue 23-Jul	18:00	19:00	FOP Unit 2	75.2°F	Day										
Tue 23-Jul	19:00	20:00	Unit 5 (5k)	75.8°F	Day										
Tue 23-Jul	20:00	21:00	Unit 5 (5k)	75.6°F	Day										
Tue 23-Jul				Sum 1300-2100											
Tue 23-Jul	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					0		22		19		7		2	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue 23-Jul	21:00	22:00	Unit 5 (5k)	75.5°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 23-Jul	22:00	23:00	Unit 5 (5k)	75.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 23-Jul	23:00	0:00	Unit 5 (5k)	74.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	0:00	1:00	Unit 5 (5k)	74.9°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 24-Jul	1:00	2:00	Unit 5 (5k)	75.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	2:00	3:00	Unit 5 (5k)	75.2°F	Night Video	0	1	0	0	0	0	0	0	0	0
Wed 24-Jul	3:00	4:00	Unit 5 (5k)	75.6°F	Night Video	0	0	1	1	0	0	0	0	0	0
Wed 24-Jul	4:00	5:00	Unit 5 (5k)	75.2°F	Night Video	0	0	1	0	0	0	0	0	0	0
Wed 24-Jul					Sum Night		-2		1		0		1		0
Wed 24-Jul	5:00	6:00	Unit 5 (5k)	74.6°F	Day	2	2	1	2	0	0	0	0	0	0
Wed 24-Jul	6:00	7:00	Unit 1	75.1°F	Day	1	0	1	0	1	0	3	0	0	0
Wed 24-Jul	7:00	8:00	Unit 1	74.1°F	Day	2	0	2	1	2	0	2	1	0	0
Wed 24-Jul	8:00	9:00	Unit 1	74.7°F	Day	6	6	5	4	2	0	0	2	0	0
Wed 24-Jul	9:00	10:00	Unit 1	75.2°F	Day	7	10	9	4	2	4	2	2	0	1
Wed 24-Jul	10:00	11:00	Unit 1	75.3°F	Day	2	1	2	2	2	1	0	0	0	0
Wed 24-Jul	11:00	12:00	Unit 1	75.4°F	Day	19	10	8	8	0	0	2	0	0	0
Wed 24-Jul	12:00	13:00	Unit 1	74.8°F	Day	3	5	0	0	1	2	1	0	0	0
Wed 24-Jul					Sum 0500-1300		8		7		3		5		-1
Wed 24-Jul	13:00	14:00	Unit 1	74.9°F	Day										
Wed 24-Jul	14:00	15:00	Unit 1	75.3°F	Day										
Wed 24-Jul	15:00	16:00	Unit 1	75.6°F	Day										
Wed 24-Jul	16:00	17:00	Unit 1	75.4°F	Day										
Wed 24-Jul	17:00	18:00	Unit 1	75.0°F	Day										
Wed 24-Jul	18:00	19:00	Unit 5 (5k)	75.3°F	Day										
Wed 24-Jul	19:00	20:00	Unit 5 (5k)	74.6°F	Day										
Wed 24-Jul	20:00	21:00	Unit 5 (5k)	74.0°F	Day										
Wed 24-Jul					Sum 1300-2100		n/a		n/a		n/a		n/a		n/a
Wed 24-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				11		14		17		10		2
Wed 24-Jul	21:00	22:00	Unit 5 (5k)	74.2°F	Night Video	0	0	0	0	0	0	0	0	0	1
Wed 24-Jul	22:00	23:00	Unit 5 (5k)	73.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	23:00	0:00	Unit 5 (5k)	74.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	0:00	1:00	Unit 5 (5k)	74.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	1:00	2:00	Unit 5 (5k)	74.4°F	Night Video	0	0	1	0	0	0	0	0	0	0
Thu 25-Jul	2:00	3:00	Unit 5 (5k)	74.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	3:00	4:00	Unit 5 (5k)	73.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	4:00	5:00	Unit 5 (5k)	73.3°F	Night Video	0	0	0	0	0	0	1	1	0	0
Thu 25-Jul					Sum Night		0		1		0		0		-1
Thu 25-Jul	5:00	6:00	Unit 5 (5k)	73.4°F	Day	1	0	0	0	0	0	4	1	0	0
Thu 25-Jul	6:00	7:00	Unit 1	73.4°F	Day	0	1	0	0	1	0	4	3	0	0
Thu 25-Jul	7:00	8:00	emerg. pumps installed	73.4°F	Day	8	2	5	1	5	0	4	0	0	0
Thu 25-Jul	8:00	9:00	Unit 1	73.1°F	Day	19	14	18	5	4	1	2	0	2	0
Thu 25-Jul	9:00	10:00	Unit 1	73.3°F	Day	24	9	14	5	6	0	4	1	2	0
Thu 25-Jul	10:00	11:00	Unit 1	73.2°F	Day	17	6	16	3	1	0	2	0	2	0
Thu 25-Jul	11:00	12:00	Unit 1	74.0°F	Day	28	14	14	2	4	0	9	3	4	0
Thu 25-Jul	12:00	13:00	Unit 1	73.6°F	Day	22	11	15	6	2	1	3	0	1	0
Thu 25-Jul					Sum 0500-1300		62		60		21		24		11
Thu 25-Jul	13:00	14:00	Unit 1	73.9°F	Day	13	8	8	4	1	0	2	1	2	1
Thu 25-Jul	14:00	15:00	Unit 1	73.8°F	Day	26	12	18	6	3	5	7	4	1	1
Thu 25-Jul	15:00	16:00	Unit 1	74.3°F	Day	19	10	12	2	5	2	3	0	0	1
Thu 25-Jul	16:00	17:00	Unit 1	70.8°F	Day	45	5	25	0	1	0	8	1	5	0
Thu 25-Jul	17:00	18:00	Unit 1	70.5°F	Day	20	1	22	1	8	2	4	0	4	0
Thu 25-Jul	18:00	19:00	FOP Unit 2	70.8°F	Day	17	1	7	0	2	0	3	0	4	1
Thu 25-Jul	19:00	20:00	FOP Unit 2	70.2°F	Day	1	1	2	0	2	1	0	0	1	1
Thu 25-Jul	20:00	21:00	FOP Unit 2	69.9°F	Day	5	0	1	0	1	0	0	0	0	1
Thu 25-Jul					Sum 1300-2100		108		82		13		21		11
Thu 25-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				204		170		41		54		26

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Thu 25-Jul	21:00	22:00	FOP Unit 2	69.8°F	Night Video	0	0	0	0	0	0	0	0	2	0
Thu 25-Jul	22:00	23:00	FOP Unit 2	70.1°F	Night Video	1	0	0	0	0	0	0	0	0	0
Thu 25-Jul	23:00	0:00	FOP Unit 2	70.3°F	Night Video	0	0	0	1	0	0	0	0	0	0
Fri 26-Jul	0:00	1:00	FOP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	1:00	2:00	FOP Unit 2	70.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	2:00	3:00	FOP Unit 2	69.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	3:00	4:00	FOP Unit 2	70.0°F	Night Video	0	0	0	0	1	0	0	0	0	0
Fri 26-Jul	4:00	5:00	FOP Unit 2	69.9°F	Night Video	1	1	0	0	0	0	0	0	0	0
Fri 26-Jul					Sum Night		1		-1		1		0		2
Fri 26-Jul	5:00	6:00	FOP Unit 2	70.2°F	Day	0	0	7	0	0	0	0	0	0	0
Fri 26-Jul	6:00	7:00	FOP Unit 2	70.1°F	Day	11	0	4	0	0	0	1	0	2	1
Fri 26-Jul	7:00	8:00	FOP Unit 2	70.5°F	Day	10	6	7	3	2	0	2	0	0	1
Fri 26-Jul	8:00	9:00	FOP Unit 2	70.9°F	Day	6	14	4	16	0	0	2	2	0	0
Fri 26-Jul	9:00	10:00	FOP Unit 2	70.9°F	Day	7	10	4	10	4	3	4	2	0	1
Fri 26-Jul	10:00	11:00	FOP Unit 2	70.8°F	Day	8	14	5	9	2	3	1	0	0	0
Fri 26-Jul	11:00	12:00	FOP Unit 2	71.2°F	Day	14	13	6	9	2	1	0	0	2	1
Fri 26-Jul	12:00	13:00	FOP Unit 2	71.1°F	Day	5	7	3	7	2	0	1	0	1	1
Fri 26-Jul					Sum 0500-1300		-3		-14		5		7		0
Fri 26-Jul	13:00	14:00	FOP Unit 2	71.0°F	Day	1	6	1	4	2	1	1	0	0	1
Fri 26-Jul	14:00	15:00	FOP Unit 2	70.6°F	Day	1	9	1	3	0	0	2	0	0	2
Fri 26-Jul	15:00	16:00	FOP Unit 2	70.8°F	Day	4	2	0	2	0	0	2	0	2	2
Fri 26-Jul	16:00	17:00	FOP Unit 2	74.6°F	Day	1	9	1	1	0	0	4	3	0	1
Fri 26-Jul	17:00	18:00	FOP Unit 2	75.8°F	Day	0	4	1	1	0	0	1	2	0	0
Fri 26-Jul	18:00	19:00	FOP Unit 2	75.5°F	Day	0	0	0	0	0	0	1	0	0	0
Fri 26-Jul	19:00	20:00	FOP Unit 2	71.1°F	Day	1	1	4	1	0	0	1	0	0	0
Fri 26-Jul	20:00	21:00	FOP Unit 2	70.9°F	Day	1	0	2	0	1	0	1	0	1	0
Fri 26-Jul					Sum 1300-2100		-22		-2		2		8		-3
Fri 26-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				-30		-19		8		18		-4
Fri 26-Jul	21:00	22:00	FOP Unit 2	70.6°F	Night Video	0	1	0	0	1	0	0	0	0	1
Fri 26-Jul	22:00	23:00	FOP Unit 2	71.0°F	Night Video	0	0	0	1	0	0	0	0	1	0
Fri 26-Jul	23:00	0:00	FOP Unit 2	71.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 27-Jul	0:00	1:00	FOP Unit 2	71.3°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	1:00	2:00	FOP Unit 2	71.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	2:00	3:00	FOP Unit 2	71.0°F	Night Video	1	1	0	0	0	0	0	0	0	0
Sat 27-Jul	3:00	4:00	FOP Unit 2	70.7°F	Night Video	3	3	0	0	0	0	1	0	0	0
Sat 27-Jul	4:00	5:00	FOP Unit 2	70.5°F	Night Video	0	0	0	1	0	0	1	0	0	0
Sat 27-Jul					Sum Night		1		-2		1		2		0
Sat 27-Jul	5:00	6:00	FOP Unit 2	70.3°F	Day	3	1	2	2	0	0	1	0	0	0
Sat 27-Jul	6:00	7:00	FOP Unit 2	72.9°F	Day	3	2	2	1	5	3	1	0	0	0
Sat 27-Jul	7:00	8:00	FOP Unit 2	72.8°F	Day	2	1	1	1	0	0	0	0	0	0
Sat 27-Jul	8:00	9:00	FOP Unit 2	73.3°F	Day	1	1	2	1	1	0	4	1	0	0
Sat 27-Jul	9:00	10:00	FOP Unit 2	73.6°F	Day	0	0	0	0	1	0	1	0	0	0
Sat 27-Jul	10:00	11:00	Unit 1	73.9°F	Day	0	0	1	0	1	0	1	1	0	0
Sat 27-Jul	11:00	12:00	Unit 1	70.8°F	Day	11	0	7	0	1	0	7	1	0	0
Sat 27-Jul	12:00	13:00	Unit 1	70.2°F	Day	22	2	16	0	8	0	10	0	0	0
Sat 27-Jul					Sum 0500-1300		35		26		14		22		0
Sat 27-Jul	13:00	14:00	Unit 1	70.2°F	Day	42	4	34	2	10	1	6	1	2	0
Sat 27-Jul	14:00	15:00	Unit 1	70.2°F	Day	77	3	39	7	3	1	5	0	4	0
Sat 27-Jul	15:00	16:00	Unit 1	70.3°F	Day	57	16	27	12	4	0	13	1	6	0
Sat 27-Jul	16:00	17:00	Unit 1	70.3°F	Day	34	35	20	16	3	1	6	0	6	1
Sat 27-Jul	17:00	18:00	Unit 1	69.9°F	Day	25	28	12	10	0	1	6	1	5	1
Sat 27-Jul	18:00	19:00	Unit 1	69.9°F	Day	22	21	8	6	0	1	4	1	2	0
Sat 27-Jul	19:00	20:00	Unit 1	69.9°F	Day	10	15	13	6	0	0	2	1	1	0
Sat 27-Jul	20:00	21:00	Unit 1	70.0°F	Day	6	9	3	1	0	0	1	0	1	0
Sat 27-Jul					Sum 1300-2100		142		96		15		38		25
Sat 27-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				212		146		35		72		30

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 27-Jul	21:00	22:00	Unit 1	69.9°F	Night Video	0	1	0	1	0	0	0	0	0	0
Sat 27-Jul	22:00	23:00	Unit 1	69.6°F	Night Video	2	3	0	1	1	0	0	0	0	0
Sat 27-Jul	23:00	0:00	Unit 1	69.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sun 28-Jul	0:00	1:00	Unit 1	69.3°F	Night Video	0	3	0	1	0	0	0	0	0	0
Sun 28-Jul	1:00	2:00	Unit 1	69.6°F	Night Video	1	4	2	4	0	0	0	0	0	0
Sun 28-Jul	2:00	3:00	Unit 1	69.8°F	Night Video	1	5	0	2	0	0	0	0	0	0
Sun 28-Jul	3:00	4:00	Unit 1	69.9°F	Night Video	0	6	1	4	0	0	0	0	0	0
Sun 28-Jul	4:00	5:00	Unit 1	69.4°F	Night Video	0	5	0	6	1	1	1	0	0	1
Sun 28-Jul					Sum Night		-22		-16	1		1		-1	
Sun 28-Jul	5:00	6:00	Unit 1	69.1°F	Day	13	8	7	1	0	0	0	0	0	1
Sun 28-Jul	6:00	7:00	Unit 1	69.2°F	Day	23	6	9	3	1	0	3	0	0	0
Sun 28-Jul	7:00	8:00	Unit 1	69.3°F	Day	63	12	33	7	3	0	9	0	5	3
Sun 28-Jul	8:00	9:00	Unit 1	69.3°F	Day	46	13	19	3	2	1	6	2	2	0
Sun 28-Jul	9:00	10:00	Unit 1	69.2°F	Day	24	5	24	4	1	0	1	0	4	1
Sun 28-Jul	10:00	11:00	Unit 1	69.3°F	Day	31	12	26	4	8	3	6	1	3	0
Sun 28-Jul	11:00	12:00	Unit 1	69.5°F	Day	34	14	22	9	1	0	7	0	5	1
Sun 28-Jul	12:00	13:00	Unit 1	69.2°F	Day	25	18	10	6	4	1	4	0	1	0
Sun 28-Jul					Sum 0500-1300	171		113		15		33		14	
Sun 28-Jul	13:00	14:00	Unit 1	69.4°F (trap)	Day	19	26	8	14	3	0	3	1	2	0
Sun 28-Jul	14:00	15:00	Unit 1	69.6°F (trap)	Day	26	32	12	7	2	0	5	0	4	0
Sun 28-Jul	15:00	16:00	Unit 1	69.3°F (trap)	Day	14	27	7	4	3	0	3	0	2	0
Sun 28-Jul	16:00	17:00	Unit 1	69.3°F (trap)	Day	15	13	9	2	2	1	5	0	1	0
Sun 28-Jul	17:00	18:00	Unit 1	69.4°F (trap)	Day	17	15	9	5	3	0	5	0	6	0
Sun 28-Jul	18:00	19:00	Unit 1	69.3°F (trap)	Day	11	10	5	5	1	0	1	0	3	1
Sun 28-Jul	19:00	20:00	Unit 1	69.3 °F (trap)	Day	4	11	5	2	2	1	1	1	5	2
Sun 28-Jul	20:00	21:00	Unit 1	69.3°F (trap)	Day	5	7	2	3	1	0	4	0	0	0
Sun 28-Jul					Sum 1300-2100		-30	15		15		25		20	
Sun 28-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			169		154		36		70		41	
Sun 28-Jul	21:00	22:00	Unit 1	69.4°F (trap)	Night Video	0	3	2	2	1	0	2	0	1	2
Sun 28-Jul	22:00	23:00	Unit 1	69.2°F (trap)	Night Video	0	5	0	2	0	0	0	0	0	0
Sun 28-Jul	23:00	0:00	Unit 1	70.2°F (trap)	Night Video	3	5	0	2	0	0	0	1	1	0
Mon 29-Jul	0:00	1:00	Unit 1	70.2°F (trap)	Night Video	0	2	0	0	0	0	0	0	0	1
Mon 29-Jul	1:00	2:00	Unit 1	70.1°F (trap)	Night Video	0	2	0	1	0	0	0	0	0	0
Mon 29-Jul	2:00	3:00	Unit 1	70.4°F (trap)	Night Video	0	2	0	1	0	0	1	0	0	0
Mon 29-Jul	3:00	4:00	Unit 1	70.4°F (trap)	Night Video	0	3	0	0	0	0	0	0	0	0
Mon 29-Jul	4:00	5:00	Unit 1	70.6°F (trap)	Night Video	1	4	0	1	0	0	0	0	0	0
Mon 29-Jul					Sum Night		-22		-7	1		2		-1	
Mon 29-Jul	5:00	6:00	Unit 1	70.5°F (trap)	Day	1	4	1	0	0	1	1	0	0	0
Mon 29-Jul	6:00	7:00	Unit 1	70.4°F (trap)	Day	11	9	1	4	4	0	7	0	0	0
Mon 29-Jul	7:00	8:00	Unit 1	70.5°F (trap)	Day	8	13	2	0	3	3	6	2	0	0
Mon 29-Jul	8:00	9:00	Unit 1	70.7°F (trap)	Day	12	7	9	7	5	4	1	0	1	0
Mon 29-Jul	9:00	10:00	Unit 1	70.9°F (trap)	Day	10	5	2	0	0	0	5	1	0	1
Mon 29-Jul	10:00	11:00	Unit 1	70.8°F (trap)	Day	7	4	5	2	4	2	4	2	1	0
Mon 29-Jul	11:00	12:00	FOP Unit 2	70.8°F (trap)	Day	8	7	5	4	3	0	1	0	0	0
Mon 29-Jul	12:00	13:00	FOP Unit 2	70.5°F (trap)	Day	4	3	1	1	5	0	0	0	1	0
Mon 29-Jul					Sum 0500-1300	9		8		14		20		2	
Mon 29-Jul	13:00	14:00	FOP Unit 2	70.8°F (trap)	Day	15	16	2	3	0	0	4	0	0	1
Mon 29-Jul	14:00	15:00	FOP Unit 2	70.5°F	Day	14	13	0	0	3	1	3	0	0	0
Mon 29-Jul	15:00	16:00	FOP Unit 2	70.6°F	Day	1	2	0	0	1	1	1	0	0	0
Mon 29-Jul	16:00	17:00	FOP Unit 2	71.0°F	Day	0	1	1	3	0	0	3	0	0	0
Mon 29-Jul	17:00	18:00	FOP Unit 2	70.8°F	Day	6	3	0	0	2	0	2	0	0	0
Mon 29-Jul	18:00	19:00	FOP Unit 2	71.0°F	Day	2	2	0	1	1	0	1	1	1	0
Mon 29-Jul	19:00	20:00	FOP Unit 2	70.8°F	Day	5	9	0	0	1	0	0	1	0	0
Mon 29-Jul	20:00	21:00	FOP Unit 2	71.0°F	Day	2	2	0	0	0	0	0	1	0	0
Mon 29-Jul					Sum 1300-2100		-3		-4	6		11		0	
Mon 29-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			7		5		24		37		2	

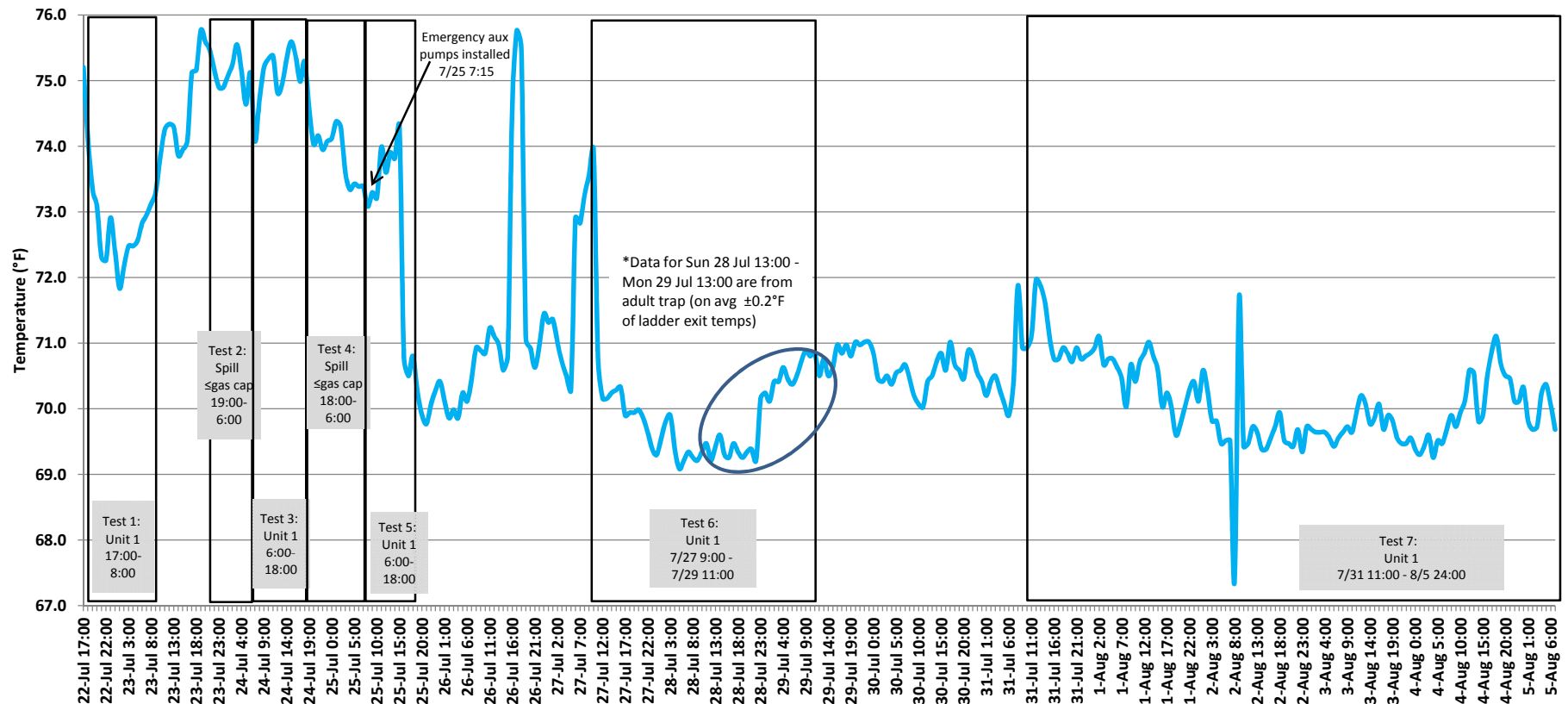
Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Mon 29-Jul	21:00	22:00	FOP Unit 2	71.0°F	Night Video	0	3	0	1	0	0	0	0	0	1
Mon 29-Jul	22:00	23:00	FOP Unit 2	71.0°F	Night Video	0	1	0	0	0	0	0	0	0	0
Mon 29-Jul	23:00	0:00	FOP Unit 2	71.0°F	Night Video	2	3	0	0	0	0	0	0	0	0
Tue 30-Jul	0:00	1:00	FOP Unit 2	70.8°F	Night Video	1	0	0	0	0	0	0	1	0	0
Tue 30-Jul	1:00	2:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	2:00	3:00	FOP Unit 2	70.4°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 30-Jul	3:00	4:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	4:00	5:00	FOP Unit 2	70.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Tue 30-Jul					Sum Night		-4		-1	0		-1		-1	
Tue 30-Jul	5:00	6:00	FOP Unit 2	70.5°F	Day	4	4	0	0	1	0	0	0	0	0
Tue 30-Jul	6:00	7:00	FOP Unit 2	70.6°F	Day	1	0	1	0	0	0	2	0	0	0
Tue 30-Jul	7:00	8:00	FOP Unit 2	70.7°F	Day	4	0	2	0	3	0	2	0	0	0
Tue 30-Jul	8:00	9:00	FOP Unit 2	70.5°F	Day	5	1	2	1	3	0	3	0	1	0
Tue 30-Jul	9:00	10:00	FOP Unit 2	70.2°F	Day	0	1	3	0	1	0	4	0	0	0
Tue 30-Jul	10:00	11:00	FOP Unit 2	70.1°F	Day	3	1	1	0	2	0	4	0	1	0
Tue 30-Jul	11:00	12:00	FOP Unit 2	70.0°F	Day	2	3	2	1	0	0	0	0	0	0
Tue 30-Jul	12:00	13:00	FOP Unit 2	70.4°F	Day	3	4	2	2	2	0	3	0	0	0
Tue 30-Jul					Sum 0500-1300	8		9		12		18		2	
Tue 30-Jul	13:00	14:00	FOP Unit 2	70.5°F	Day	2	5	8	2	1	1	2	0	0	0
Tue 30-Jul	14:00	15:00	FOP Unit 2	70.7°F	Day	5	2	2	2	0	0	1	0	0	0
Tue 30-Jul	15:00	16:00	FOP Unit 2	70.8°F	Day	9	9	3	1	1	0	1	0	0	0
Tue 30-Jul	16:00	17:00	FOP Unit 2	70.6°F	Day	7	3	3	4	3	0	2	0	0	0
Tue 30-Jul	17:00	18:00	FOP Unit 2	71.0°F	Day	6	5	1	1	2	0	2	1	0	0
Tue 30-Jul	18:00	19:00	FOP Unit 2	70.7°F	Day	7	9	0	1	0	0	1	0	0	0
Tue 30-Jul	19:00	20:00	FOP Unit 2	70.6°F	Day	0	0	0	1	1	0	1	0	0	0
Tue 30-Jul	20:00	21:00	FOP Unit 2	70.5°F	Day	2	2	0	0	0	0	1	0	0	0
Tue 30-Jul					Sum 1300-2100	3		5		7		10		0	
Tue 30-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			13		17		23		34		2	
Tue 30-Jul	21:00	22:00	FOP Unit 2	70.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	22:00	23:00	FOP Unit 2	70.8°F	Night Video	0	0	0	0	0	0	1	0	0	0
Tue 30-Jul	23:00	0:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	0:00	1:00	FOP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	1:00	2:00	FOP Unit 2	70.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	2:00	3:00	FOP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 31-Jul	3:00	4:00	FOP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	4:00	5:00	FOP Unit 2	70.3°F	Night Video	1	1	0	1	0	0	0	0	0	0
Wed 31-Jul					Sum Night	0		-1		0		2		0	
Wed 31-Jul	5:00	6:00	FOP Unit 2	70.1°F	Day	1	1	2	0	0	0	1	0	0	0
Wed 31-Jul	6:00	7:00	FOP Unit 2	69.9°F	Day	6	2	2	0	6	2	2	0	0	0
Wed 31-Jul	7:00	8:00	FOP Unit 2	70.4°F	Day	5	2	2	0	8	1	7	0	0	0
Wed 31-Jul	8:00	9:00	FOP Unit 2	71.9°F	Day	8	0	1	0	1	0	2	0	0	0
Wed 31-Jul	9:00	10:00	FOP Unit 2	70.9°F	Day	2	0	0	0	0	0	0	0	0	0
Wed 31-Jul	10:00	11:00	FOP Unit 2	70.9°F	Day	6	3	2	1	3	0	3	1	0	0
Wed 31-Jul	11:00	12:00	Unit 1	71.1°F	Day	2	0	0	0	0	0	3	0	0	0
Wed 31-Jul	12:00	13:00	Unit 1	72.0°F	Day	3	5	1	0	2	2	2	0	0	0
Wed 31-Jul					Sum 0500-1300	20		9		15		19		0	
Wed 31-Jul	13:00	14:00	Unit 1	71.9°F	Day	6	6	2	2	1	0	3	1	0	0
Wed 31-Jul	14:00	15:00	Unit 1	71.6°F	Day	5	7	6	2	12	6	5	2	0	0
Wed 31-Jul	15:00	16:00	Unit 1	71.1°F	Day	14	16	8	3	0	0	2	0	1	0
Wed 31-Jul	16:00	17:00	Unit 1	70.8°F	Day	10	4	15	4	5	1	9	2	0	0
Wed 31-Jul	17:00	18:00	Unit 1	70.8°F	Day	13	9	6	4	0	0	3	0	0	0
Wed 31-Jul	18:00	19:00	Unit 1	70.9°F	Day	1	6	1	1	1	1	1	0	0	0
Wed 31-Jul	19:00	20:00	Unit 1	70.8°F	Day	4	5	3	2	2	0	3	1	1	0
Wed 31-Jul	20:00	21:00	Unit 1	70.7°F	Day	6	5	2	1	0	0	0	0	0	0
Wed 31-Jul					Sum 1300-2100	1		24		13		20		2	
Wed 31-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			25		40		34		47		2	

Date	Start Time	End Time	Unit	Priority	Ladder Exit Temp (°F)	Count	Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
								Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Wed 31-Jul	21:00	22:00	Unit 1		70.9°F	Night	Video	2	5	0	0	0	1	0	0	0	0
Wed 31-Jul	22:00	23:00	Unit 1		70.8°F	Night	Video	0	2	0	0	0	0	0	0	0	0
Wed 31-Jul	23:00	0:00	Unit 1		70.8°F	Night	Video	0	0	0	0	0	1	0	0	0	0
Thu 01-Aug	0:00	1:00	Unit 1		70.8°F	Night	Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug	1:00	2:00	Unit 1		70.9°F	Night	Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug	2:00	3:00	Unit 1		71.1°F	Night	Video	0	0	0	1	0	0	0	0	0	0
Thu 01-Aug	3:00	4:00	Unit 1		70.7°F	Night	Video	0	0	0	1	0	0	0	0	0	0
Thu 01-Aug	4:00	5:00	Unit 1		70.8°F	Night	Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug						Sum Night			-5		-2		-2		0		0
Thu 01-Aug	5:00	6:00	Unit 1		70.8°F	Day		0	1	0	0	0	0	1	0	0	0
Thu 01-Aug	6:00	7:00	Unit 1		70.6°F	Day		17	1	9	5	2	0	3	1	0	0
Thu 01-Aug	7:00	8:00	Unit 1		70.5°F	Day		9	3	6	3	2	0	5	0	0	0
Thu 01-Aug	8:00	9:00	Unit 1		70.0°F	Day		13	7	17	7	5	0	5	1	2	0
Thu 01-Aug	9:00	10:00	Unit 1		70.7°F	Day		23	11	13	1	3	0	2	0	3	0
Thu 01-Aug	10:00	11:00	Unit 1		70.4°F	Day		24	12	19	7	7	0	5	0	1	0
Thu 01-Aug	11:00	12:00	Unit 1		70.7°F	Day		24	8	11	3	6	1	7	0	1	0
Thu 01-Aug	12:00	13:00	Unit 1		70.8°F	Day		25	34	18	13	4	1	9	1	2	1
Thu 01-Aug						Sum 0500-1300		58		54		27		34		8	
Thu 01-Aug	13:00	14:00	Unit 1		71.0°F	Day		24	24	13	10	3	0	4	0	2	2
Thu 01-Aug	14:00	15:00	Unit 1		70.8°F	Day		14	12	16	7	8	5	4	1	0	1
Thu 01-Aug	15:00	16:00	Unit 1		70.6°F	Day		6	12	12	8	0	0	4	0	2	0
Thu 01-Aug	16:00	17:00	Unit 1		70.0°F	Day		8	8	2	1	1	0	8	2	4	0
Thu 01-Aug	17:00	18:00	Unit 1		70.2°F	Day		13	11	3	5	2	0	1	1	2	0
Thu 01-Aug	18:00	19:00	Unit 1		70.0°F	Day		5	6	5	0	0	1	0	0	1	0
Thu 01-Aug	19:00	20:00	Unit 1		69.6°F	Day		5	7	0	0	0	0	2	0	3	0
Thu 01-Aug	20:00	21:00	Unit 1		69.8°F	Day		1	2	1	0	1	0	0	1	2	3
Thu 01-Aug						Sum 1300-2100			-6		21		9		18		10
Thu 01-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2		62		90		43		62		22	
Thu 01-Aug	21:00	22:00	Unit 1		70.0°F	Night	Video	0	2	0	1	0	0	0	0	0	3
Thu 01-Aug	22:00	23:00	Unit 1		70.3°F	Night	Video	0	2	0	1	0	0	0	0	0	1
Thu 01-Aug	23:00	0:00	Unit 1		70.4°F	Night	Video	0	0	0	0	0	0	0	0	0	1
Fri 02-Aug	0:00	1:00	Unit 1		70.1°F	Night	Video	0	1	0	2	0	0	0	0	0	1
Fri 02-Aug	1:00	2:00	Unit 1		70.6°F	Night	Video	0	5	0	0	0	0	0	0	0	0
Fri 02-Aug	2:00	3:00	Unit 1		70.3°F	Night	Video	1	1	0	2	0	0	0	0	0	0
Fri 02-Aug	3:00	4:00	Unit 1		69.8°F	Night	Video	1	2	0	1	0	0	0	0	0	0
Fri 02-Aug	4:00	5:00	Unit 1		69.8°F	Night	Video	0	1	0	0	0	0	0	0	0	0
Fri 02-Aug						Sum Night			-12		-7		0		0		-6
Fri 02-Aug	5:00	6:00	Unit 1		69.5°F	Day		2	3	0	1	0	0	0	0	0	0
Fri 02-Aug	6:00	7:00	Unit 1		69.5°F	Day		11	3	4	1	5	1	4	2	0	0
Fri 02-Aug	7:00	8:00	Unit 1		69.5°F	Day		18	10	16	7	2	0	2	0	0	0
Fri 02-Aug	8:00	9:00	Unit 1		67.4°F	Day		22	12	18	7	1	0	3	0	0	0
Fri 02-Aug	9:00	10:00	Unit 1		71.7°F	Day		12	4	12	10	1	0	4	0	0	0
Fri 02-Aug	10:00	11:00	Unit 1		69.4°F	Day		7	4	6	3	1	0	1	1	0	0
Fri 02-Aug	11:00	12:00	Unit 1		69.5°F	Day		19	13	12	11	1	0	10	0	1	0
Fri 02-Aug	12:00	13:00	Unit 1		69.7°F	Day		16	20	6	6	1	0	3	1	0	1
Fri 02-Aug						Sum 0500-1300		38		28		11		23		0	
Fri 02-Aug	13:00	14:00	Unit 1		69.6°F	Day		6	9	13	8	3	1	0	0	1	0
Fri 02-Aug	14:00	15:00	Unit 1		69.4°F	Day		8	5	9	6	1	0	1	1	1	0
Fri 02-Aug	15:00	16:00	Unit 1		69.4°F	Day		19	20	8	7	4	0	3	0	1	0
Fri 02-Aug	16:00	17:00	Unit 1		69.6°F	Day		11	14	6	4	1	1	5	3	2	1
Fri 02-Aug	17:00	18:00	Unit 1		69.7°F	Day		4	7	4	1	1	0	5	4	2	2
Fri 02-Aug	18:00	19:00	Unit 1		69.9°F	Day		3	8	3	1	0	1	1	1	0	0
Fri 02-Aug	19:00	20:00	Unit 1		69.5°F	Day		3	2	1	2	0	0	0	0	1	0
Fri 02-Aug	20:00	21:00	Unit 1		69.5°F	Day		1	1	1	0	0	0	0	0	0	0
Fri 02-Aug						Sum 1300-2100			-11		16		7		6		5
Fri 02-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2		32		53		22		35		7	

Date	Start Time	End Time	Unit	Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
							Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Fri 02-Aug	21:00	22:00	Unit 1		69.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 02-Aug	22:00	23:00	Unit 1		69.7°F	Night Video	0	0	0	1	0	0	0	0	0	0
Fri 02-Aug	23:00	0:00	Unit 1		69.3°F	Night Video	0	0	0	1	0	0	0	0	1	2
Sat 03-Aug	0:00	1:00	Unit 1		69.7°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 03-Aug	1:00	2:00	Unit 1		69.7°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sat 03-Aug	2:00	3:00	Unit 1		69.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 03-Aug	3:00	4:00	Unit 1		69.6°F	Night Video	0	1	0	2	0	0	0	0	0	0
Sat 03-Aug	4:00	5:00	Unit 1		69.6°F	Night Video	0	5	0	0	0	0	0	0	0	0
Sat 03-Aug						Sum Night		-7		-4	0		0		-1	
Sat 03-Aug	5:00	6:00	Unit 1		69.6°F	Day	0	0	0	1	1	0	1	0	0	0
Sat 03-Aug	6:00	7:00	Unit 1		69.4°F	Day	7	3	7	2	1	0	1	0	0	0
Sat 03-Aug	7:00	8:00	Unit 1		69.6°F	Day	17	5	9	4	3	0	2	0	1	0
Sat 03-Aug	8:00	9:00	Unit 1		69.6°F	Day	26	8	5	2	2	0	5	3	0	0
Sat 03-Aug	9:00	10:00	Unit 1		69.7°F	Day	14	13	6	2	4	1	3	0	0	0
Sat 03-Aug	10:00	11:00	Unit 1		69.6°F	Day	14	4	11	2	1	0	4	0	0	0
Sat 03-Aug	11:00	12:00	Unit 1		69.9°F	Day	14	10	12	7	5	0	13	5	0	0
Sat 03-Aug	12:00	13:00	Unit 1		70.2°F	Day	8	11	7	8	3	0	10	3	1	0
Sat 03-Aug						Sum 0500-1300	46		29		19		28		2	
Sat 03-Aug	13:00	14:00	Unit 1		70.1°F	Day	13	7	9	3	6	1	0	1	0	0
Sat 03-Aug	14:00	15:00	Unit 1		69.8°F	Day	11	6	6	6	8	4	5	0	0	0
Sat 03-Aug	15:00	16:00	Unit 1		69.9°F	Day	8	7	4	2	2	1	3	1	0	0
Sat 03-Aug	16:00	17:00	Unit 1		70.1°F	Day	16	8	5	0	2	0	4	1	0	0
Sat 03-Aug	17:00	18:00	Unit 1		69.7°F	Day	9	14	3	1	4	2	1	0	0	0
Sat 03-Aug	18:00	19:00	Unit 1		69.9°F	Day	7	9	3	2	0	0	1	0	0	0
Sat 03-Aug	19:00	20:00	Unit 1		69.8°F	Day	3	6	1	0	4	0	1	0	0	0
Sat 03-Aug	20:00	21:00	Unit 1		69.6°F	Day	2	4	0	0	0	0	1	0	0	0
Sat 03-Aug						Sum 1300-2100	8		17		18		13		0	
Sat 03-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2	65		55		44		49		2	
Sat 03-Aug	21:00	22:00	Unit 1		69.5°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sat 03-Aug	22:00	23:00	Unit 1		69.5°F	Night Video	0	2	0	1	0	0	0	0	0	0
Sat 03-Aug	23:00	0:00	Unit 1		69.6°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sun 04-Aug	0:00	1:00	Unit 1		69.4°F	Night Video	0	0	0	0	0	1	1	0	0	0
Sun 04-Aug	1:00	2:00	Unit 1		69.3°F	Night Video	0	2	0	0	0	0	0	0	0	0
Sun 04-Aug	2:00	3:00	Unit 1		69.4°F	Night Video	1	0	0	0	1	0	0	0	0	0
Sun 04-Aug	3:00	4:00	Unit 1		69.6°F	Night Video	0	3	0	0	0	0	0	0	0	0
Sun 04-Aug	4:00	5:00	Unit 1		69.3°F	Night Video	0	1	0	0	0	0	1	0	0	0
Sun 04-Aug						Sum Night		-9		-1	0		2		0	
Sun 04-Aug	5:00	6:00	Unit 1		69.5°F	Day	0	4	1	1	0	0	0	0	0	0
Sun 04-Aug	6:00	7:00	Unit 1		69.5°F	Day	4	4	6	3	4	0	1	0	0	0
Sun 04-Aug	7:00	8:00	Unit 1		69.7°F	Day	6	2	2	1	4	0	5	0	1	0
Sun 04-Aug	8:00	9:00	Unit 1		69.9°F	Day	5	2	1	1	3	0	4	1	0	0
Sun 04-Aug	9:00	10:00	Unit 1		69.7°F	Day	8	4	5	0	1	0	9	1	0	0
Sun 04-Aug	10:00	11:00	Unit 1		69.9°F	Day	6	7	4	2	6	0	9	0	0	0
Sun 04-Aug	11:00	12:00	Unit 1		70.1°F	Day	3	5	2	1	2	0	4	1	0	0
Sun 04-Aug	12:00	13:00	Unit 1		70.6°F	Day	1	5	3	1	1	0	3	1	0	0
Sun 04-Aug						Sum 0500-1300	0		14		21		31		1	
Sun 04-Aug	13:00	14:00	Unit 1		70.5°F	Day	4	0	2	1	2	0	3	0	0	0
Sun 04-Aug	14:00	15:00	Unit 1		69.8°F	Day	5	2	2	1	0	0	1	0	0	0
Sun 04-Aug	15:00	16:00	Unit 1		69.9°F	Day	2	4	1	0	5	2	3	1	1	0
Sun 04-Aug	16:00	17:00	Unit 1		70.5°F	Day	4	3	1	0	1	0	4	0	1	0
Sun 04-Aug	17:00	18:00	Unit 1		70.9°F	Day	0	1	2	0	0	0	3	0	0	0
Sun 04-Aug	18:00	19:00	Unit 1		71.1°F	Day	0	3	2	0	1	0	2	1	1	0
Sun 04-Aug	19:00	20:00	Unit 1		70.7°F	Day	1	2	1	0	1	0	0	0	1	1
Sun 04-Aug	20:00	21:00	Unit 1		70.5°F	Day	1	1	0	0	0	0	0	0	0	0
Sun 04-Aug						Sum 1300-2100	1		9		8		14		3	
Sun 04-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2	1		28		35		54		5	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sun 04-Aug	21:00	22:00	Unit 1	70.5°F	Night Video										
Sun 04-Aug	22:00	23:00	Unit 1	70.1°F	Night Video										
Sun 04-Aug	23:00	0:00	Unit 1	70.1°F	Night Video										
Mon 05-Aug	0:00	1:00	Unit 1	70.3°F	Night Video										
Mon 05-Aug	1:00	2:00	Unit 1	69.8°F	Night Video										
Mon 05-Aug	2:00	3:00	Unit 1	69.7°F	Night Video										
Mon 05-Aug	3:00	4:00	Unit 1	69.7°F	Night Video										
Mon 05-Aug	4:00	5:00	Unit 1	70.2°F	Night Video										
Mon 05-Aug					Sum Night		0		0		0		0		0
Mon 05-Aug	5:00	6:00	Unit 1	70.4°F	Day	0	1	0	0	0	0	0	0	0	0
Mon 05-Aug	6:00	7:00	Unit 1	70.1°F	Day	3	0	3	3	6	0	3	0	0	0
Mon 05-Aug	7:00	8:00	Unit 1	69.7°F	Day	5	1	3	0	6	0	10	1	0	0
Mon 05-Aug	8:00	9:00	Unit 1		Day	3	1	6	2	2	0	1	0	0	0
Mon 05-Aug	9:00	10:00	Unit 1		Day	6	3	2	1	1	1	2	0	0	0
Mon 05-Aug	10:00	11:00	Unit 1		Day	3	2	3	0	4	0	7	0	0	0
Mon 05-Aug	11:00	12:00	Unit 1		Day	7	6	2	1	6	1	9	7	0	0
Mon 05-Aug	12:00	13:00	Unit 1		Day	4	4	2	2	2	0	5	1	0	0
Mon 05-Aug					Sum 0500-1300		13		12		25		28		0
Mon 05-Aug	13:00	14:00	Unit 1		Day										
Mon 05-Aug	14:00	15:00	Unit 1		Day										
Mon 05-Aug	15:00	16:00	Unit 1		Day										
Mon 05-Aug	16:00	17:00	Unit 1		Day										
Mon 05-Aug	17:00	18:00	Unit 1		Day										
Mon 05-Aug	18:00	19:00	Unit 1		Day										
Mon 05-Aug	19:00	20:00	Unit 1		Day										
Mon 05-Aug	20:00	21:00	Unit 1		Day										
Mon 05-Aug					Sum 1300-2100		0		0		0		0		0
Mon 05-Aug Day Total (FPC) = Sum 0500-2100 expanded by 1.2						16		14		30		34		0	

LWG Adult Ladder Exit Temp (°F), 22 July 17:00 - 5 Aug 06:00



Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

August 5, 2013

Notes: Pat Vivian

1. Introduction

Today's unscheduled TMT conference call was chaired and facilitated by Doug Baus, COE. Representatives of the COE, Oregon, BPA, Washington, Idaho, BOR, NOAA, CRITFC/Umatilla, USFWS and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lower Granite Dam Operations for Adult Ladder Temperature Issues

Today's meeting was the seventh in a series of TMT conference calls regarding adult passage at Lower Granite Dam. The purpose of this meeting was to review the effects of the Unit 1 priority operation over the weekend and decide whether to continue that operation until August 10, when the fish facility roof repair is scheduled to begin.

Baus reviewed updated passage and temperature data for Lower Granite, shown in attachments 2a and 2b to today's agenda. Five adult sockeye passed Lower Granite on August 4, two on August 3 and two on August 1, so the weekend operation did not result in any significant sockeye passage.

Ladder exit temperatures over the past few days have been in the 69-70 degrees F range. At 7 am this morning, the exit temperature was 69.7 degrees F. Unit 1 is currently passing 17.1 kcfs and the RSW is spilling 6.9 kcfs as coordinated in the TMT call last Friday, August 2.

An increased forecast for Lower Granite inflows means operating the RSW shouldn't be a problem, Baus reported. The current RFC forecast shows Lower Granite inflows in the range of 25-27 kcfs over the next 10 days.

Ann Setter, COE, gave an update on project conditions. Although she expected ladder temperatures to decrease as a result of the Unit 1 priority operation, there were no noteworthy temperature changes over the weekend. Temperatures at the project are expected to rise again in the coming week. It does appear that operating Unit 1 in conjunction with the emergency pump facilitates adult sockeye passage. Although the improvement was minimal, taking action turned out to be better than doing nothing. There is no clear explanation of how the synergy between pumping and operating Unit 1 helps adults move through the ladder, and there are unanswered questions concerning this year's sockeye run. Some might have traveled upstream through the navigation lock, Scott Bettin, BPA, said.

Baus asked for feedback from FPAC on the Unit 1 priority operation. This morning FPAC reviewed the latest passage and temperature data for Lower Granite, Tom Lorz, CRITFC/Umatilla, reported. FPAC's recommendation is to continue operating Unit 1 as the priority unit with the RSW spilling from 5 am to 5 pm. At 5 pm, transition to running Unit 5 at speed-no-load and spill the remainder up to the gas cap until 5 am the next morning. Russ Kiefer, Idaho, said FPAC made this unanimous recommendation because operating Unit 1 doesn't seem to provide much benefit to adult passage at night, and alternating with nighttime spill up to the gas cap and operating Unit 5 at speed-no-load will provide better passage conditions for juveniles. Margaret Filardo, FPC, noted that Dave Statler, Nez Perce Tribe, supports the recommendation although he was not present on today's call.

The Action Agencies held a caucus and made slight modifications to the FPAC proposal. They proposed to maintain Unit 1 priority with RSW spill from 5 am to 5 pm as inflows allow, and would switch to a uniform spill pattern with no RSW if inflows drop below approximately 24 kcfs. From 5 pm to 5 am, operate Unit 4 priority at speed-no-load (5 kcfs) and spill up to the gas cap (currently 26 kcfs) using the FPP spill pattern with the RSW operating. This operation would remain in effect through August 10 at 9:30 am, when daily powerhouse outages begin for roof repair work.

Baus asked the Salmon Managers whether operating Unit 4 at speed-no-load instead of Unit 5 would be consistent with their objectives. Hearing no objections, the COE will implement this operation at Lower Granite beginning at 5 pm tonight until daily outages begin for the roof work on the morning of Saturday, August 10.

3. Next TMT Meeting

Given the large number of unscheduled meetings TMT has held recently to address passage conditions at Lower Granite, the TMT members present today agreed to cancel the next regularly scheduled meeting on August 7. TMT will meet again in a conference call on August 14.

<i>Name</i>	<i>Affiliation</i>
Dan Baus	COE
Erick Van Dyke	Oregon
Scott Bettin	BPA
Charles Morrill	Washington
Russ Kiefer	Idaho
John Roache	BOR
Rich Domingue	NOAA
Trevor Conder	NOAA
Tom Lorz	CRITFC/Umatilla
David Wills	USFWS

Dave Benner	FPC
Margaret Filardo	FPC
Brandon Chockley	FPC
Greg Moody	COE Walla Walla
Ann Setter	COE Walla Walla
Laura Hamilton	COE
Barry Espenson	CBB

TECHNICAL MANAGEMENT TEAM

NOAA: Paul Wagner / Richard Domingue

USFWS: David Wills / Steve Haeseker

OR: Erick Van Dyke

ID: Russ Kiefer / Pete Hassemer

WA: Charles Morrill

MT: Jim Litchfield / Brian Marotz

Kootenai: Sue Ireland / Billy Barquin

Spokane: Andy Miller

Colville: Sheri Sears / Keith Wolf

Nez Perce: Dave Statler

Umatilla: Tom Lorz (CRITFC)

BOR: John Roache / Mary Mellema / Pat McGrane

BPA: Tony Norris / Scott Bettin / Robyn MacKay

COE: Doug Baus / Karl Kanbergs

TMT MEETING

Wednesday August 7, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room

Portland, Oregon 97209-4142

Map Quest [\[Directions\]](#)

TMT MEETING

Phone Number (877) 336-1274

Access Code 3871669

Security Code 5092

We have had disruptions on the phone because people are not hitting 'mute' after dial in.

Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.

Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

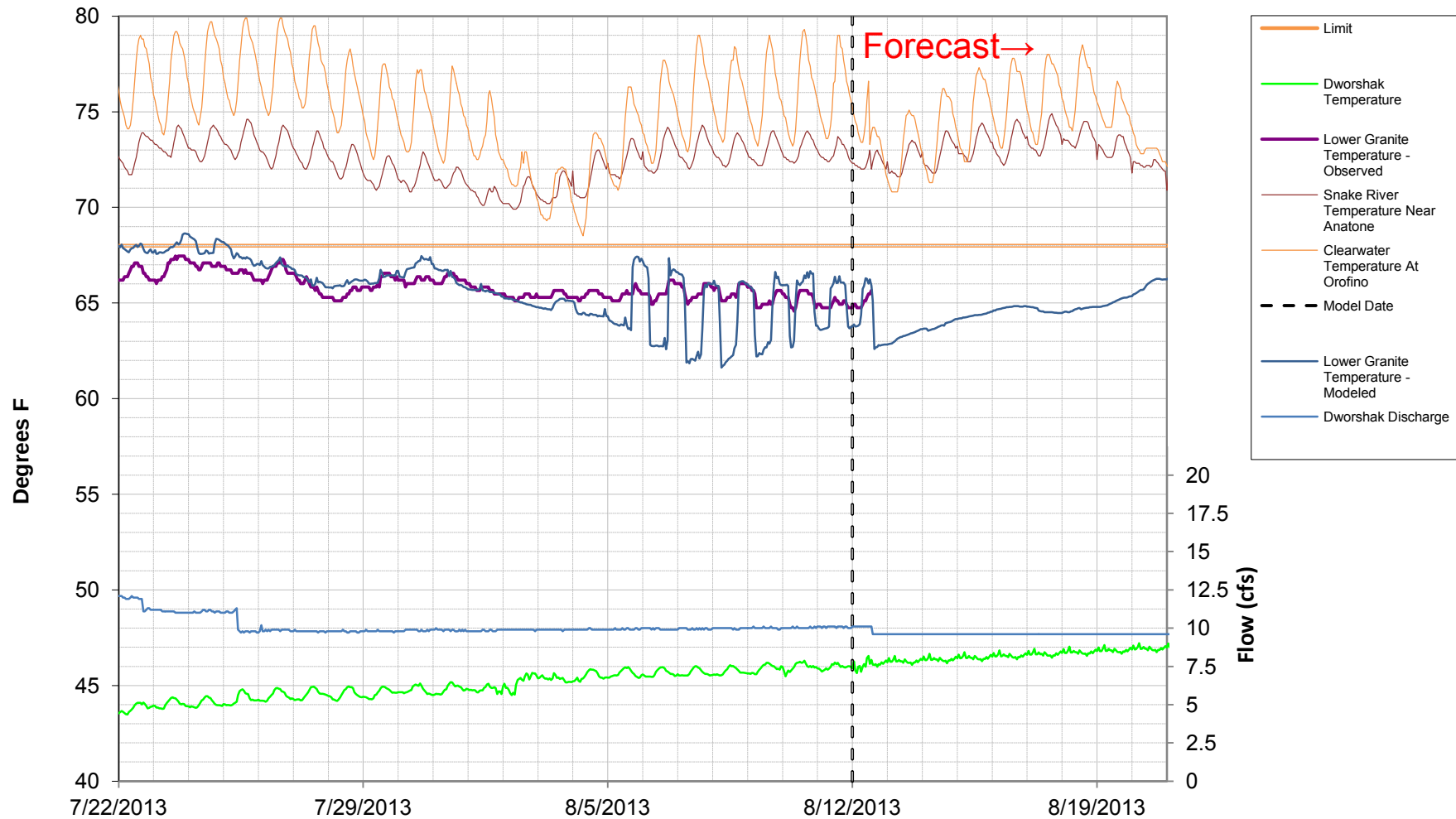
1. Welcome and Introductions
2. Review Meeting Minutes - [July 22, 23, 24, 26, 29, 31, August 2](#)
3. Lower Granite Dam Operations for Adult Ladder Temperature Issues - Doug Baus, COE NWD / Ann Setter, COE NWW / Russ Kiefer, Idaho
4. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality

- d. Power System
- 5. Other
 - a. Set agenda and date for next meeting - **August 14, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

Analog Year 2008 ORFI -1 ANQW +0
DWR out 9.6 KCFS

Water Temperature Comparisons Model from 7/22/2013 to 8/21/2013 Observed Data to 8/12/2013



TECHNICAL MANAGEMENT TEAM

COE:	Doug Baus / Karl Kanbergs	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
BOR:	John Roache / Mary Mellema / Pat McGrane		
NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)	Salish-Kootenai:	Stu Levit

TMT CONFERENCE CALL

Wednesday, August 14, 2013 9:00 am - 12:00 pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 5436

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**We have had disruptions when people do not mute their phones.
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*All members are encouraged to contact Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnv.net or call her at (503) 248-4703.*

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AGENDA

1. Welcome and Introductions
2. Treaty Fishing SOR - Kyle Dittmer / CRITFC
 - a. [SOR 2013-C6](#)
3. Lower Granite Dam Operations for Adult Ladder Temperature Issues - Doug Baus, COE NWD / Ann Setter, COE NWW / Russ Kiefer, Idaho
 - a. Adult Passage Counts and Ladder Temperatures (July 22-Aug 12) - Hourly Data [\[PDF\]](#) [\[Excel\]](#)
 - b. Adult Ladder Exit Temperature (July 22-Aug 12) - Graph [\[PDF\]](#)
 - c. Project Operations (July 22-Aug 12) - Hourly Data [\[PDF\]](#)
4. Lower Monumental Juvenile Transportation - Doug Baus, COE NWD / Ken Fone, COE NWW

5. Dworshak Temperature Operation - *Steve Hall, COE NWW*
 - a. [Model](#)
6. Spill Priority List - *Doug Baus, COE NWD*
 - a. [Winter time](#)
7. Other
 - a. Set agenda and date for next meeting - **August 21, 2013**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down	Chinook jack Up Down	Steelhead clipped Up Down	Steelhead wild Up Down	Sockeye Up Down
Mon 22-Jul	5:00	6:00	FPP Unit 2	73.3°F	Day					
Mon 22-Jul	6:00	7:00	FPP Unit 2	73.7°F	Day					
Mon 22-Jul	7:00	8:00	FPP Unit 2	73.9°F	Day					
Mon 22-Jul	8:00	9:00	FPP Unit 2	74.0°F	Day					
Mon 22-Jul	9:00	10:00	FPP Unit 2	74.0°F	Day					
Mon 22-Jul	10:00	11:00	FPP Unit 2	75.0°F	Day					
Mon 22-Jul	11:00	12:00	FPP Unit 2	75.1°F	Day					
Mon 22-Jul	12:00	13:00	FPP Unit 2	75.4°F	Day					
Mon 22-Jul					Sum 0500-1300	n/a	n/a	n/a	n/a	n/a
Mon 22-Jul	13:00	14:00	FPP Unit 2	75.1°F	Day					
Mon 22-Jul	14:00	15:00	FPP Unit 2	74.8°F	Day					
Mon 22-Jul	15:00	16:00	FPP Unit 2	74.5°F	Day					
Mon 22-Jul	16:00	17:00	FPP Unit 2	75.2°F	Day					
Mon 22-Jul	17:00	18:00	Unit 1	75.2°F	Day					
Mon 22-Jul	18:00	19:00	Unit 1	74.1°F	Day					
Mon 22-Jul	19:00	20:00	Unit 1	73.3°F	Day					
Mon 22-Jul	20:00	21:00	Unit 1	73.1°F	Day					
Mon 22-Jul					Sum 1300-2100	n/a	n/a	n/a	n/a	n/a
Mon 22-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			20	11	16	10	6
Mon 22-Jul	21:00	22:00	Unit 1	72.3°F	Night Video					
Mon 22-Jul	22:00	23:00	Unit 1	72.3°F	Night Video					
Mon 22-Jul	23:00	0:00	Unit 1	72.9°F	Night Video					
Tue 23-Jul	0:00	1:00	Unit 1	72.4°F	Night Video					
Tue 23-Jul	1:00	2:00	Unit 1	71.8°F	Night Video					
Tue 23-Jul	2:00	3:00	Unit 1	72.2°F	Night Video					
Tue 23-Jul	3:00	4:00	Unit 1	72.5°F	Night Video					
Tue 23-Jul	4:00	5:00	Unit 1	72.5°F	Night Video					
Tue 23-Jul					Sum Night	n/a	n/a	n/a	n/a	n/a
Tue 23-Jul	5:00	6:00	Unit 1	72.6°F	Day	8 0	6 0	0 0	0 0	0 0
Tue 23-Jul	6:00	7:00	Unit 1	72.8°F	Day	20 17	12 9	1 1	1 0	0 0
Tue 23-Jul	7:00	8:00	Unit 1	73.0°F	Day	29 24	33 14	7 1	3 1	1 0
Tue 23-Jul	8:00	9:00	FPP Unit 2	73.1°F	Day	17 20	23 28	2 1	1 0	0 0
Tue 23-Jul	9:00	10:00	FPP Unit 2	73.3°F	Day	4 5	1 7	1 3	1 1	0 0
Tue 23-Jul	10:00	11:00	FPP Unit 2	73.8°F	Day	7 14	2 0	2 0	1 1	0 0
Tue 23-Jul	11:00	12:00	FPP Unit 2	74.3°F	Day	2 5	0 0	0 1	0 0	0 1
Tue 23-Jul	12:00	13:00	FPP Unit 2	74.3°F	Day	5 5	0 2	6 2	2 0	1 0
Tue 23-Jul					Sum 0500-1300	2	17	10	6	1
Tue 23-Jul	13:00	14:00	FPP Unit 2	74.3°F	Day					
Tue 23-Jul	14:00	15:00	FPP Unit 2	73.9°F	Day					
Tue 23-Jul	15:00	16:00	FPP Unit 2	73.9°F	Day					
Tue 23-Jul	16:00	17:00	FPP Unit 2	74.1°F	Day					
Tue 23-Jul	17:00	18:00	FPP Unit 2	75.1°F	Day					
Tue 23-Jul	18:00	19:00	FPP Unit 2	75.2°F	Day					
Tue 23-Jul	19:00	20:00	Spill ≤ TDG cap	75.8°F	Day					
Tue 23-Jul	20:00	21:00	Spill ≤ TDG cap	75.6°F	Day					
Tue 23-Jul					Sum 1300-2100	n/a	n/a	n/a	n/a	n/a
Tue 23-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			0	22	19	7	2

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue 23-Jul	21:00	22:00	Spill ≤ TDG cap	75.5°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 23-Jul	22:00	23:00	Spill ≤ TDG cap	75.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 23-Jul	23:00	0:00	Spill ≤ TDG cap	74.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	0:00	1:00	Spill ≤ TDG cap	74.9°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 24-Jul	1:00	2:00	Spill ≤ TDG cap	75.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	2:00	3:00	Spill ≤ TDG cap	75.2°F	Night Video	0	1	0	0	0	0	0	0	0	0
Wed 24-Jul	3:00	4:00	Spill ≤ TDG cap	75.6°F	Night Video	0	0	1	1	0	0	0	0	0	0
Wed 24-Jul	4:00	5:00	Spill ≤ TDG cap	75.2°F	Night Video	0	0	1	0	0	0	0	0	0	0
Wed 24-Jul					Sum Night		-2		1		0		1		0
Wed 24-Jul	5:00	6:00	Spill ≤ TDG cap	74.6°F	Day	2	2	1	2	0	0	0	0	0	0
Wed 24-Jul	6:00	7:00	Unit 1	75.1°F	Day	1	0	1	0	1	0	3	0	0	0
Wed 24-Jul	7:00	8:00	Unit 1	74.1°F	Day	2	0	2	1	2	0	2	1	0	0
Wed 24-Jul	8:00	9:00	Unit 1	74.7°F	Day	6	6	5	4	2	0	0	2	0	0
Wed 24-Jul	9:00	10:00	Unit 1	75.2°F	Day	7	10	9	4	2	4	2	2	0	1
Wed 24-Jul	10:00	11:00	Unit 1	75.3°F	Day	2	1	2	2	2	1	0	0	0	0
Wed 24-Jul	11:00	12:00	Unit 1	75.4°F	Day	19	10	8	8	0	0	2	0	0	0
Wed 24-Jul	12:00	13:00	Unit 1	74.8°F	Day	3	5	0	0	1	2	1	0	0	0
Wed 24-Jul					Sum 0500-1300		8		7		3		5		-1
Wed 24-Jul	13:00	14:00	Unit 1	74.9°F	Day										
Wed 24-Jul	14:00	15:00	Unit 1	75.3°F	Day										
Wed 24-Jul	15:00	16:00	Unit 1	75.6°F	Day										
Wed 24-Jul	16:00	17:00	Unit 1	75.4°F	Day										
Wed 24-Jul	17:00	18:00	Unit 1	75.0°F	Day										
Wed 24-Jul	18:00	19:00	Spill ≤ TDG cap	75.3°F	Day										
Wed 24-Jul	19:00	20:00	Spill ≤ TDG cap	74.6°F	Day										
Wed 24-Jul	20:00	21:00	Spill ≤ TDG cap	74.0°F	Day										
Wed 24-Jul					Sum 1300-2100		n/a		n/a		n/a		n/a		n/a
Wed 24-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				11		14		17		10		2
Wed 24-Jul	21:00	22:00	Spill ≤ TDG cap	74.2°F	Night Video	0	0	0	0	0	0	0	0	0	1
Wed 24-Jul	22:00	23:00	Spill ≤ TDG cap	73.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 24-Jul	23:00	0:00	Spill ≤ TDG cap	74.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	0:00	1:00	Spill ≤ TDG cap	74.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	1:00	2:00	Spill ≤ TDG cap	74.4°F	Night Video	0	0	1	0	0	0	0	0	0	0
Thu 25-Jul	2:00	3:00	Spill ≤ TDG cap	74.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	3:00	4:00	Spill ≤ TDG cap	73.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 25-Jul	4:00	5:00	Spill ≤ TDG cap	73.3°F	Night Video	0	0	0	0	0	0	1	1	0	0
Thu 25-Jul					Sum Night		0		1		0		0		-1
Thu 25-Jul	5:00	6:00	Spill ≤ TDG cap	73.4°F	Day	1	0	0	0	0	0	4	1	0	0
Thu 25-Jul	6:00	7:00	Unit 1	73.4°F	Day	0	1	0	0	1	0	4	3	0	0
Thu 25-Jul	7:00	8:00	Emerg. pumps installed	73.4°F	Day	8	2	5	1	5	0	4	0	0	0
Thu 25-Jul	8:00	9:00	Unit 1	73.1°F	Day	19	14	18	5	4	1	2	0	2	0
Thu 25-Jul	9:00	10:00	Unit 1	73.3°F	Day	24	9	14	5	6	0	4	1	2	0
Thu 25-Jul	10:00	11:00	Unit 1	73.2°F	Day	17	6	16	3	1	0	2	0	2	0
Thu 25-Jul	11:00	12:00	Unit 1	74.0°F	Day	28	14	14	2	4	0	9	3	4	0
Thu 25-Jul	12:00	13:00	Unit 1	73.6°F	Day	22	11	15	6	2	1	3	0	1	0
Thu 25-Jul					Sum 0500-1300		62		60		21		24		11
Thu 25-Jul	13:00	14:00	Unit 1	73.9°F	Day	13	8	8	4	1	0	2	1	2	1
Thu 25-Jul	14:00	15:00	Unit 1	73.8°F	Day	26	12	18	6	3	5	7	4	1	1
Thu 25-Jul	15:00	16:00	Unit 1	74.3°F	Day	19	10	12	2	5	2	3	0	0	1
Thu 25-Jul	16:00	17:00	Unit 1	70.8°F	Day	45	5	25	0	1	0	8	1	5	0
Thu 25-Jul	17:00	18:00	Unit 1	70.5°F	Day	20	1	22	1	8	2	4	0	4	0
Thu 25-Jul	18:00	19:00	FPP Unit 2	70.8°F	Day	17	1	7	0	2	0	3	0	4	1
Thu 25-Jul	19:00	20:00	FPP Unit 2	70.2°F	Day	1	1	2	0	2	1	0	0	1	1
Thu 25-Jul	20:00	21:00	FPP Unit 2	69.9°F	Day	5	0	1	0	1	0	0	0	0	1
Thu 25-Jul					Sum 1300-2100		108		82		13		21		11
Thu 25-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				204		170		41		54		26

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Thu 25-Jul	21:00	22:00	FPP Unit 2	69.8°F	Night Video	0	0	0	0	0	0	0	0	2	0
Thu 25-Jul	22:00	23:00	FPP Unit 2	70.1°F	Night Video	1	0	0	0	0	0	0	0	0	0
Thu 25-Jul	23:00	0:00	FPP Unit 2	70.3°F	Night Video	0	0	0	1	0	0	0	0	0	0
Fri 26-Jul	0:00	1:00	FPP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	1:00	2:00	FPP Unit 2	70.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	2:00	3:00	FPP Unit 2	69.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 26-Jul	3:00	4:00	FPP Unit 2	70.0°F	Night Video	0	0	0	0	1	0	0	0	0	0
Fri 26-Jul	4:00	5:00	FPP Unit 2	69.9°F	Night Video	1	1	0	0	0	0	0	0	0	0
Fri 26-Jul					Sum Night		1		-1		1		0		2
Fri 26-Jul	5:00	6:00	FPP Unit 2	70.2°F	Day	0	0	7	0	0	0	0	0	0	0
Fri 26-Jul	6:00	7:00	FPP Unit 2	70.1°F	Day	11	0	4	0	0	0	1	0	2	1
Fri 26-Jul	7:00	8:00	FPP Unit 2	70.5°F	Day	10	6	7	3	2	0	2	0	0	1
Fri 26-Jul	8:00	9:00	FPP Unit 2	70.9°F	Day	6	14	4	16	0	0	2	2	0	0
Fri 26-Jul	9:00	10:00	FPP Unit 2	70.9°F	Day	7	10	4	10	4	3	4	2	0	1
Fri 26-Jul	10:00	11:00	FPP Unit 2	70.8°F	Day	8	14	5	9	2	3	1	0	0	0
Fri 26-Jul	11:00	12:00	FPP Unit 2	71.2°F	Day	14	13	6	9	2	1	0	0	2	1
Fri 26-Jul	12:00	13:00	FPP Unit 2	71.1°F	Day	5	7	3	7	2	0	1	0	1	1
Fri 26-Jul					Sum 0500-1300		-3		-14		5		7		0
Fri 26-Jul	13:00	14:00	FPP Unit 2	71.0°F	Day	1	6	1	4	2	1	1	0	0	1
Fri 26-Jul	14:00	15:00	FPP Unit 2	70.6°F	Day	1	9	1	3	0	0	2	0	0	2
Fri 26-Jul	15:00	16:00	FPP Unit 2	70.8°F	Day	4	2	0	2	0	0	2	0	2	2
Fri 26-Jul	16:00	17:00	FPP Unit 2	74.6°F	Day	1	9	1	1	0	0	4	3	0	1
Fri 26-Jul	17:00	18:00	FPP Unit 2	75.8°F	Day	0	4	1	1	0	0	1	2	0	0
Fri 26-Jul	18:00	19:00	FPP Unit 2	75.5°F	Day	0	0	0	0	0	0	1	0	0	0
Fri 26-Jul	19:00	20:00	FPP Unit 2	71.1°F	Day	1	1	4	1	0	0	1	0	0	0
Fri 26-Jul	20:00	21:00	FPP Unit 2	70.9°F	Day	1	0	2	0	1	0	1	0	1	0
Fri 26-Jul					Sum 1300-2100		-22		-2		2		8		-3
Fri 26-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				-30		-19		8		18		-4
Fri 26-Jul	21:00	22:00	FPP Unit 2	70.6°F	Night Video	0	1	0	0	1	0	0	0	0	1
Fri 26-Jul	22:00	23:00	FPP Unit 2	71.0°F	Night Video	0	0	0	1	0	0	0	0	1	0
Fri 26-Jul	23:00	0:00	FPP Unit 2	71.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 27-Jul	0:00	1:00	FPP Unit 2	71.3°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	1:00	2:00	FPP Unit 2	71.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sat 27-Jul	2:00	3:00	FPP Unit 2	71.0°F	Night Video	1	1	0	0	0	0	0	0	0	0
Sat 27-Jul	3:00	4:00	FPP Unit 2	70.7°F	Night Video	3	3	0	0	0	0	1	0	0	0
Sat 27-Jul	4:00	5:00	FPP Unit 2	70.5°F	Night Video	0	0	0	1	0	0	1	0	0	0
Sat 27-Jul					Sum Night		1		-2		1		2		0
Sat 27-Jul	5:00	6:00	FPP Unit 2	70.3°F	Day	3	1	2	2	0	0	1	0	0	0
Sat 27-Jul	6:00	7:00	FPP Unit 2	72.9°F	Day	3	2	2	1	5	3	1	0	0	0
Sat 27-Jul	7:00	8:00	FPP Unit 2	72.8°F	Day	2	1	1	1	0	0	0	0	0	0
Sat 27-Jul	8:00	9:00	FPP Unit 2	73.3°F	Day	1	1	2	1	1	0	4	1	0	0
Sat 27-Jul	9:00	10:00	FPP Unit 2	73.6°F	Day	0	0	0	0	1	0	1	0	0	0
Sat 27-Jul	10:00	11:00	Unit 1	73.9°F	Day	0	0	1	0	1	0	1	1	0	0
Sat 27-Jul	11:00	12:00	Unit 1	70.8°F	Day	11	0	7	0	1	0	7	1	0	0
Sat 27-Jul	12:00	13:00	Unit 1	70.2°F	Day	22	2	16	0	8	0	10	0	0	0
Sat 27-Jul					Sum 0500-1300		35		26		14		22		0
Sat 27-Jul	13:00	14:00	Unit 1	70.2°F	Day	42	4	34	2	10	1	6	1	2	0
Sat 27-Jul	14:00	15:00	Unit 1	70.2°F	Day	77	3	39	7	3	1	5	0	4	0
Sat 27-Jul	15:00	16:00	Unit 1	70.3°F	Day	57	16	27	12	4	0	13	1	6	0
Sat 27-Jul	16:00	17:00	Unit 1	70.3°F	Day	34	35	20	16	3	1	6	0	6	1
Sat 27-Jul	17:00	18:00	Unit 1	69.9°F	Day	25	28	12	10	0	1	6	1	5	1
Sat 27-Jul	18:00	19:00	Unit 1	69.9°F	Day	22	21	8	6	0	1	4	1	2	0
Sat 27-Jul	19:00	20:00	Unit 1	69.9°F	Day	10	15	13	6	0	0	2	1	1	0
Sat 27-Jul	20:00	21:00	Unit 1	70.0°F	Day	6	9	3	1	0	0	1	0	1	0
Sat 27-Jul					Sum 1300-2100		142		96		15		38		25
Sat 27-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				212		146		35		72		30

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 27-Jul	21:00	22:00	Unit 1	69.9°F	Night Video	0	1	0	1	0	0	0	0	0	0
Sat 27-Jul	22:00	23:00	Unit 1	69.6°F	Night Video	2	3	0	1	1	0	0	0	0	0
Sat 27-Jul	23:00	0:00	Unit 1	69.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Sun 28-Jul	0:00	1:00	Unit 1	69.3°F	Night Video	0	3	0	1	0	0	0	0	0	0
Sun 28-Jul	1:00	2:00	Unit 1	69.6°F	Night Video	1	4	2	4	0	0	0	0	0	0
Sun 28-Jul	2:00	3:00	Unit 1	69.8°F	Night Video	1	5	0	2	0	0	0	0	0	0
Sun 28-Jul	3:00	4:00	Unit 1	69.9°F	Night Video	0	6	1	4	0	0	0	0	0	0
Sun 28-Jul	4:00	5:00	Unit 1	69.4°F	Night Video	0	5	0	6	1	1	1	0	0	1
Sun 28-Jul					Sum Night		-22		-16	1		1			-1
Sun 28-Jul	5:00	6:00	Unit 1	69.1°F	Day	13	8	7	1	0	0	0	0	0	1
Sun 28-Jul	6:00	7:00	Unit 1	69.2°F	Day	23	6	9	3	1	0	3	0	0	0
Sun 28-Jul	7:00	8:00	Unit 1	69.3°F	Day	63	12	33	7	3	0	9	0	5	3
Sun 28-Jul	8:00	9:00	Unit 1	69.3°F	Day	46	13	19	3	2	1	6	2	2	0
Sun 28-Jul	9:00	10:00	Unit 1	69.2°F	Day	24	5	24	4	1	0	1	0	4	1
Sun 28-Jul	10:00	11:00	Unit 1	69.3°F	Day	31	12	26	4	8	3	6	1	3	0
Sun 28-Jul	11:00	12:00	Unit 1	69.5°F	Day	34	14	22	9	1	0	7	0	5	1
Sun 28-Jul	12:00	13:00	Unit 1	69.2°F	Day	25	18	10	6	4	1	4	0	1	0
Sun 28-Jul					Sum 0500-1300		171		113	15		33		14	
Sun 28-Jul	13:00	14:00	Unit 1	69.4°F (trap)	Day	19	26	8	14	3	0	3	1	2	0
Sun 28-Jul	14:00	15:00	Unit 1	69.6°F (trap)	Day	26	32	12	7	2	0	5	0	4	0
Sun 28-Jul	15:00	16:00	Unit 1	69.3°F (trap)	Day	14	27	7	4	3	0	3	0	2	0
Sun 28-Jul	16:00	17:00	Unit 1	69.3°F (trap)	Day	15	13	9	2	2	1	5	0	1	0
Sun 28-Jul	17:00	18:00	Unit 1	69.4°F (trap)	Day	17	15	9	5	3	0	5	0	6	0
Sun 28-Jul	18:00	19:00	Unit 1	69.3°F (trap)	Day	11	10	5	5	1	0	1	0	3	1
Sun 28-Jul	19:00	20:00	Unit 1	69.3 °F (trap)	Day	4	11	5	2	2	1	1	1	5	2
Sun 28-Jul	20:00	21:00	Unit 1	69.3°F (trap)	Day	5	7	2	3	1	0	4	0	0	0
Sun 28-Jul					Sum 1300-2100		-30		15	15		25		20	
Sun 28-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				169		154	36		70		41	
Sun 28-Jul	21:00	22:00	Unit 1	69.4°F (trap)	Night Video	0	3	2	2	1	0	2	0	1	2
Sun 28-Jul	22:00	23:00	Unit 1	69.2°F (trap)	Night Video	0	5	0	2	0	0	0		0	0
Sun 28-Jul	23:00	0:00	Unit 1	70.2°F (trap)	Night Video	3	5	0	2	0	0	0	1	1	0
Mon 29-Jul	0:00	1:00	Unit 1	70.2°F (trap)	Night Video	0	2	0	0	0	0	0	0	0	1
Mon 29-Jul	1:00	2:00	Unit 1	70.1°F (trap)	Night Video	0	2	0	1	0	0	0	0	0	0
Mon 29-Jul	2:00	3:00	Unit 1	70.4°F (trap)	Night Video	0	2	0	1	0	0	1	0	0	0
Mon 29-Jul	3:00	4:00	Unit 1	70.4°F (trap)	Night Video	0	3	0	0	0	0	0	0	0	0
Mon 29-Jul	4:00	5:00	Unit 1	70.6°F (trap)	Night Video	1	4	0	1	0	0	0	0	0	0
Mon 29-Jul					Sum Night		-22		-7	1		2			-1
Mon 29-Jul	5:00	6:00	Unit 1	70.5°F (trap)	Day	1	4	1	0	0	1	1	0	0	0
Mon 29-Jul	6:00	7:00	Unit 1	70.4°F (trap)	Day	11	9	1	4	4	0	7	0	0	0
Mon 29-Jul	7:00	8:00	Unit 1	70.5°F (trap)	Day	8	13	2	0	3	3	6	2	0	0
Mon 29-Jul	8:00	9:00	Unit 1	70.7°F (trap)	Day	12	7	9	7	5	4	1	0	1	0
Mon 29-Jul	9:00	10:00	Unit 1	70.9°F (trap)	Day	10	5	2	0	0	0	5	1	0	1
Mon 29-Jul	10:00	11:00	Unit 1	70.8°F (trap)	Day	7	4	5	2	4	2	4	2	1	0
Mon 29-Jul	11:00	12:00	FPP Unit 2	70.8°F (trap)	Day	8	7	5	4	3	0	1	0	0	0
Mon 29-Jul	12:00	13:00	FPP Unit 2	70.5°F (trap)	Day	4	3	1	1	5	0	0	0	1	0
Mon 29-Jul					Sum 0500-1300		9		8	14		20		2	
Mon 29-Jul	13:00	14:00	FPP Unit 2	70.8°F (trap)	Day	15	16	2	3	0	0	4	0	0	1
Mon 29-Jul	14:00	15:00	FPP Unit 2	70.5°F	Day	14	13	0	0	3	1	3	0	0	0
Mon 29-Jul	15:00	16:00	FPP Unit 2	70.6°F	Day	1	2	0	0	1	1	1	0	0	0
Mon 29-Jul	16:00	17:00	FPP Unit 2	71.0°F	Day	0	1	1	3	0	0	3	0	0	0
Mon 29-Jul	17:00	18:00	FPP Unit 2	70.8°F	Day	6	3	0	0	2	0	2	0	0	0
Mon 29-Jul	18:00	19:00	FPP Unit 2	71.0°F	Day	2	2	0	1	1	0	1	1	1	0
Mon 29-Jul	19:00	20:00	FPP Unit 2	70.8°F	Day	5	9	0	0	1	0	0	1	0	0
Mon 29-Jul	20:00	21:00	FPP Unit 2	71.0°F	Day	2	2	0	0	0	0	0	1	0	0
Mon 29-Jul					Sum 1300-2100		-3		-4	6		11		0	
Mon 29-Jul			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				7		5	24		37		2	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Mon 29-Jul	21:00	22:00	FPP Unit 2	71.0°F	Night Video	0	3	0	1	0	0	0	0	0	1
Mon 29-Jul	22:00	23:00	FPP Unit 2	71.0°F	Night Video	0	1	0	0	0	0	0	0	0	0
Mon 29-Jul	23:00	0:00	FPP Unit 2	71.0°F	Night Video	2	3	0	0	0	0	0	0	0	0
Tue 30-Jul	0:00	1:00	FPP Unit 2	70.8°F	Night Video	1	0	0	0	0	0	0	1	0	0
Tue 30-Jul	1:00	2:00	FPP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	2:00	3:00	FPP Unit 2	70.4°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 30-Jul	3:00	4:00	FPP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	4:00	5:00	FPP Unit 2	70.4°F	Night Video	1	0	0	0	0	0	0	0	0	0
Tue 30-Jul					Sum Night		-4		-1		0		-1		-1
Tue 30-Jul	5:00	6:00	FPP Unit 2	70.5°F	Day	4	4	0	0	1	0	0	0	0	0
Tue 30-Jul	6:00	7:00	FPP Unit 2	70.6°F	Day	1	0	1	0	0	0	2	0	0	0
Tue 30-Jul	7:00	8:00	FPP Unit 2	70.7°F	Day	4	0	2	0	3	0	2	0	0	0
Tue 30-Jul	8:00	9:00	FPP Unit 2	70.5°F	Day	5	1	2	1	3	0	3	0	1	0
Tue 30-Jul	9:00	10:00	FPP Unit 2	70.2°F	Day	0	1	3	0	1	0	4	0	0	0
Tue 30-Jul	10:00	11:00	FPP Unit 2	70.1°F	Day	3	1	1	0	2	0	4	0	1	0
Tue 30-Jul	11:00	12:00	FPP Unit 2	70.0°F	Day	2	3	2	1	0	0	0	0	0	0
Tue 30-Jul	12:00	13:00	FPP Unit 2	70.4°F	Day	3	4	2	2	2	0	3	0	0	0
Tue 30-Jul					Sum 0500-1300		8		9		12		18		2
Tue 30-Jul	13:00	14:00	FPP Unit 2	70.5°F	Day	2	5	8	2	1	1	2	0	0	0
Tue 30-Jul	14:00	15:00	FPP Unit 2	70.7°F	Day	5	2	2	2	0	0	1	0	0	0
Tue 30-Jul	15:00	16:00	FPP Unit 2	70.8°F	Day	9	9	3	1	1	0	1	0	0	0
Tue 30-Jul	16:00	17:00	FPP Unit 2	70.6°F	Day	7	3	3	4	3	0	2	0	0	0
Tue 30-Jul	17:00	18:00	FPP Unit 2	71.0°F	Day	6	5	1	1	2	0	2	1	0	0
Tue 30-Jul	18:00	19:00	FPP Unit 2	70.7°F	Day	7	9	0	1	0	0	1	0	0	0
Tue 30-Jul	19:00	20:00	FPP Unit 2	70.6°F	Day	0	0	0	1	1	0	1	0	0	0
Tue 30-Jul	20:00	21:00	FPP Unit 2	70.5°F	Day	2	2	0	0	0	0	1	0	0	0
Tue 30-Jul					Sum 1300-2100		3		5		7		10		0
Tue 30-Jul					Day Total (FPC) = Sum 0500-2100 expanded by 1.2		13		17		23		34		2
Tue 30-Jul	21:00	22:00	FPP Unit 2	70.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 30-Jul	22:00	23:00	FPP Unit 2	70.8°F	Night Video	0	0	0	0	0	0	1	0	0	0
Tue 30-Jul	23:00	0:00	FPP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	0:00	1:00	FPP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	1:00	2:00	FPP Unit 2	70.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	2:00	3:00	FPP Unit 2	70.4°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 31-Jul	3:00	4:00	FPP Unit 2	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 31-Jul	4:00	5:00	FPP Unit 2	70.3°F	Night Video	1	1	0	1	0	0	0	0	0	0
Wed 31-Jul					Sum Night		0		-1		0		2		0
Wed 31-Jul	5:00	6:00	FPP Unit 2	70.1°F	Day	1	1	2	0	0	0	1	0	0	0
Wed 31-Jul	6:00	7:00	FPP Unit 2	69.9°F	Day	6	2	2	0	6	2	2	0	0	0
Wed 31-Jul	7:00	8:00	FPP Unit 2	70.4°F	Day	5	2	2	0	8	1	7	0	0	0
Wed 31-Jul	8:00	9:00	FPP Unit 2	71.9°F	Day	8	0	1	0	1	0	2	0	0	0
Wed 31-Jul	9:00	10:00	FPP Unit 2	70.9°F	Day	2	0	0	0	0	0	0	0	0	0
Wed 31-Jul	10:00	11:00	FPP Unit 2	70.9°F	Day	6	3	2	1	3	0	3	1	0	0
Wed 31-Jul	11:00	12:00	Unit 1	71.1°F	Day	2	0	0	0	0	0	3	0	0	0
Wed 31-Jul	12:00	13:00	Unit 1	72.0°F	Day	3	5	1	0	2	2	2	0	0	0
Wed 31-Jul					Sum 0500-1300		20		9		15		19		0
Wed 31-Jul	13:00	14:00	Unit 1	71.9°F	Day	6	6	2	2	1	0	3	1	0	0
Wed 31-Jul	14:00	15:00	Unit 1	71.6°F	Day	5	7	6	2	12	6	5	2	0	0
Wed 31-Jul	15:00	16:00	Unit 1	71.1°F	Day	14	16	8	3	0	0	2	0	1	0
Wed 31-Jul	16:00	17:00	Unit 1	70.8°F	Day	10	4	15	4	5	1	9	2	0	0
Wed 31-Jul	17:00	18:00	Unit 1	70.8°F	Day	13	9	6	4	0	0	3	0	0	0
Wed 31-Jul	18:00	19:00	Unit 1	70.9°F	Day	1	6	1	1	1	1	1	0	0	0
Wed 31-Jul	19:00	20:00	Unit 1	70.8°F	Day	4	5	3	2	2	0	3	1	1	0
Wed 31-Jul	20:00	21:00	Unit 1	70.7°F	Day	6	5	2	1	0	0	0	0	0	0
Wed 31-Jul					Sum 1300-2100		1		24		13		20		2
Wed 31-Jul					Day Total (FPC) = Sum 0500-2100 expanded by 1.2		25		40		34		47		2

Date	Start Time	End Time	Unit	Priority	Ladder Exit Temp (°F)	Count	Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
								Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Wed 31-Jul	21:00	22:00	Unit 1		70.9°F	Night	Video	2	5	0	0	0	1	0	0	0	0
Wed 31-Jul	22:00	23:00	Unit 1		70.8°F	Night	Video	0	2	0	0	0	0	0	0	0	0
Wed 31-Jul	23:00	0:00	Unit 1		70.8°F	Night	Video	0	0	0	0	0	1	0	0	0	0
Thu 01-Aug	0:00	1:00	Unit 1		70.8°F	Night	Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug	1:00	2:00	Unit 1		70.9°F	Night	Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug	2:00	3:00	Unit 1		71.1°F	Night	Video	0	0	0	1	0	0	0	0	0	0
Thu 01-Aug	3:00	4:00	Unit 1		70.7°F	Night	Video	0	0	0	1	0	0	0	0	0	0
Thu 01-Aug	4:00	5:00	Unit 1		70.8°F	Night	Video	0	0	0	0	0	0	0	0	0	0
Thu 01-Aug						Sum Night			-5		-2		-2		0		0
Thu 01-Aug	5:00	6:00	Unit 1		70.8°F	Day		0	1	0	0	0	0	1	0	0	0
Thu 01-Aug	6:00	7:00	Unit 1		70.6°F	Day		17	1	9	5	2	0	3	1	0	0
Thu 01-Aug	7:00	8:00	Unit 1		70.5°F	Day		9	3	6	3	2	0	5	0	0	0
Thu 01-Aug	8:00	9:00	Unit 1		70.0°F	Day		13	7	17	7	5	0	5	1	2	0
Thu 01-Aug	9:00	10:00	Unit 1		70.7°F	Day		23	11	13	1	3	0	2	0	3	0
Thu 01-Aug	10:00	11:00	Unit 1		70.4°F	Day		24	12	19	7	7	0	5	0	1	0
Thu 01-Aug	11:00	12:00	Unit 1		70.7°F	Day		24	8	11	3	6	1	7	0	1	0
Thu 01-Aug	12:00	13:00	Unit 1		70.8°F	Day		25	34	18	13	4	1	9	1	2	1
Thu 01-Aug						Sum 0500-1300			58		54		27		34		8
Thu 01-Aug	13:00	14:00	Unit 1		71.0°F	Day		24	24	13	10	3	0	4	0	2	2
Thu 01-Aug	14:00	15:00	Unit 1		70.8°F	Day		14	12	16	7	8	5	4	1	0	1
Thu 01-Aug	15:00	16:00	Unit 1		70.6°F	Day		6	12	12	8	0	0	4	0	2	0
Thu 01-Aug	16:00	17:00	Unit 1		70.0°F	Day		8	8	2	1	1	0	8	2	4	0
Thu 01-Aug	17:00	18:00	Unit 1		70.2°F	Day		13	11	3	5	2	0	1	1	2	0
Thu 01-Aug	18:00	19:00	Unit 1		70.0°F	Day		5	6	5	0	0	1	0	0	1	0
Thu 01-Aug	19:00	20:00	Unit 1		69.6°F	Day		5	7	0	0	0	0	2	0	3	0
Thu 01-Aug	20:00	21:00	Unit 1		69.8°F	Day		1	2	1	0	1	0	0	1	2	3
Thu 01-Aug						Sum 1300-2100			-6		21		9		18		10
Thu 01-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2			62		90		43		62		22
Thu 01-Aug	21:00	22:00	Unit 1		70.0°F	Night	Video	0	2	0	1	0	0	0	0	0	3
Thu 01-Aug	22:00	23:00	Unit 1		70.3°F	Night	Video	0	2	0	1	0	0	0	0	0	1
Thu 01-Aug	23:00	0:00	Unit 1		70.4°F	Night	Video	0	0	0	0	0	0	0	0	0	1
Fri 02-Aug	0:00	1:00	Unit 1		70.1°F	Night	Video	0	1	0	2	0	0	0	0	0	1
Fri 02-Aug	1:00	2:00	Unit 1		70.6°F	Night	Video	0	5	0	0	0	0	0	0	0	0
Fri 02-Aug	2:00	3:00	Unit 1		70.3°F	Night	Video	1	1	0	2	0	0	0	0	0	0
Fri 02-Aug	3:00	4:00	Unit 1		69.8°F	Night	Video	1	2	0	1	0	0	0	0	0	0
Fri 02-Aug	4:00	5:00	Unit 1		69.8°F	Night	Video	0	1	0	0	0	0	0	0	0	0
Fri 02-Aug						Sum Night			-12		-7		0		0		-6
Fri 02-Aug	5:00	6:00	Unit 1		69.5°F	Day		2	3	0	1	0	0	0	0	0	0
Fri 02-Aug	6:00	7:00	Unit 1		69.5°F	Day		11	3	4	1	5	1	4	2	0	0
Fri 02-Aug	7:00	8:00	Unit 1		69.5°F	Day		18	10	16	7	2	0	2	0	0	0
Fri 02-Aug	8:00	9:00	Unit 1		67.4°F	Day		22	12	18	7	1	0	3	0	0	0
Fri 02-Aug	9:00	10:00	Unit 1		71.7°F	Day		12	4	12	10	1	0	4	0	0	0
Fri 02-Aug	10:00	11:00	Unit 1		69.4°F	Day		7	4	6	3	1	0	1	1	0	0
Fri 02-Aug	11:00	12:00	Unit 1		69.5°F	Day		19	13	12	11	1	0	10	0	1	0
Fri 02-Aug	12:00	13:00	Unit 1		69.7°F	Day		16	20	6	6	1	0	3	1	0	1
Fri 02-Aug						Sum 0500-1300			38		28		11		23		0
Fri 02-Aug	13:00	14:00	Unit 1		69.6°F	Day		6	9	13	8	3	1	0	0	1	0
Fri 02-Aug	14:00	15:00	Unit 1		69.4°F	Day		8	5	9	6	1	0	1	1	1	0
Fri 02-Aug	15:00	16:00	Unit 1		69.4°F	Day		19	20	8	7	4	0	3	0	1	0
Fri 02-Aug	16:00	17:00	Unit 1		69.6°F	Day		11	14	6	4	1	1	5	3	2	1
Fri 02-Aug	17:00	18:00	Unit 1		69.7°F	Day		4	7	4	1	1	0	5	4	2	2
Fri 02-Aug	18:00	19:00	Unit 1		69.9°F	Day		3	8	3	1	0	1	1	1	0	0
Fri 02-Aug	19:00	20:00	Unit 1		69.5°F	Day		3	2	1	2	0	0	0	0	1	0
Fri 02-Aug	20:00	21:00	Unit 1		69.5°F	Day		1	1	1	0	0	0	0	0	0	0
Fri 02-Aug						Sum 1300-2100			-11		16		7		6		5
Fri 02-Aug						Day Total (FPC) = Sum 0500-2100 expanded by 1.2			32		53		22		35		7

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Fri 02-Aug	21:00	22:00	Unit 1	69.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 02-Aug	22:00	23:00	Unit 1	69.7°F	Night Video	0	0	0	1	0	0	0	0	0	0
Fri 02-Aug	23:00	0:00	Unit 1	69.3°F	Night Video	0	0	0	1	0	0	0	0	1	2
Sat 03-Aug	0:00	1:00	Unit 1	69.7°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 03-Aug	1:00	2:00	Unit 1	69.7°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sat 03-Aug	2:00	3:00	Unit 1	69.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 03-Aug	3:00	4:00	Unit 1	69.6°F	Night Video	0	1	0	2	0	0	0	0	0	0
Sat 03-Aug	4:00	5:00	Unit 1	69.6°F	Night Video	0	5	0	0	0	0	0	0	0	0
Sat 03-Aug					Sum Night		-7		-4		0		0		-1
Sat 03-Aug	5:00	6:00	Unit 1	69.6°F	Day	0	0	0	1	1	0	1	0	0	0
Sat 03-Aug	6:00	7:00	Unit 1	69.4°F	Day	7	3	7	2	1	0	1	0	0	0
Sat 03-Aug	7:00	8:00	Unit 1	69.6°F	Day	17	5	9	4	3	0	2	0	1	0
Sat 03-Aug	8:00	9:00	Unit 1	69.6°F	Day	26	8	5	2	2	0	5	3	0	0
Sat 03-Aug	9:00	10:00	Unit 1	69.7°F	Day	14	13	6	2	4	1	3	0	0	0
Sat 03-Aug	10:00	11:00	Unit 1	69.6°F	Day	14	4	11	2	1	0	4	0	0	0
Sat 03-Aug	11:00	12:00	Unit 1	69.9°F	Day	14	10	12	7	5	0	13	5	0	0
Sat 03-Aug	12:00	13:00	Unit 1	70.2°F	Day	8	11	7	8	3	0	10	3	1	0
Sat 03-Aug					Sum 0500-1300		46		29		19		28		2
Sat 03-Aug	13:00	14:00	Unit 1	70.1°F	Day	13	7	9	3	6	1	0	1	0	0
Sat 03-Aug	14:00	15:00	Unit 1	69.8°F	Day	11	6	6	6	8	4	5	0	0	0
Sat 03-Aug	15:00	16:00	Unit 1	69.9°F	Day	8	7	4	2	2	1	3	1	0	0
Sat 03-Aug	16:00	17:00	Unit 1	70.1°F	Day	16	8	5	0	2	0	4	1	0	0
Sat 03-Aug	17:00	18:00	Unit 1	69.7°F	Day	9	14	3	1	4	2	1	0	0	0
Sat 03-Aug	18:00	19:00	Unit 1	69.9°F	Day	7	9	3	2	0	0	1	0	0	0
Sat 03-Aug	19:00	20:00	Unit 1	69.8°F	Day	3	6	1	0	4	0	1	0	0	0
Sat 03-Aug	20:00	21:00	Unit 1	69.6°F	Day	2	4	0	0	0	0	1	0	0	0
Sat 03-Aug					Sum 1300-2100		8		17		18		13		0
Sat 03-Aug					Day Total (FPC) = Sum 0500-2100 expanded by 1.2		65		55		44		49		2
Sat 03-Aug	21:00	22:00	Unit 1	69.5°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sat 03-Aug	22:00	23:00	Unit 1	69.5°F	Night Video	0	2	0	1	0	0	0	0	0	0
Sat 03-Aug	23:00	0:00	Unit 1	69.6°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sun 04-Aug	0:00	1:00	Unit 1	69.4°F	Night Video	0	0	0	0	0	1	1	0	0	0
Sun 04-Aug	1:00	2:00	Unit 1	69.3°F	Night Video	0	2	0	0	0	0	0	0	0	0
Sun 04-Aug	2:00	3:00	Unit 1	69.4°F	Night Video	1	0	0	0	1	0	0	0	0	0
Sun 04-Aug	3:00	4:00	Unit 1	69.6°F	Night Video	0	3	0	0	0	0	0	0	0	0
Sun 04-Aug	4:00	5:00	Unit 1	69.3°F	Night Video	0	1	0	0	0	0	1	0	0	0
Sun 04-Aug					Sum Night		-9		-1		0		2		0
Sun 04-Aug	5:00	6:00	Unit 1	69.5°F	Day	0	4	1	1	0	0	0	0	0	0
Sun 04-Aug	6:00	7:00	Unit 1	69.5°F	Day	4	4	6	3	4	0	1	0	0	0
Sun 04-Aug	7:00	8:00	Unit 1	69.7°F	Day	6	2	2	1	4	0	5	0	1	0
Sun 04-Aug	8:00	9:00	Unit 1	69.9°F	Day	5	2	1	1	3	0	4	1	0	0
Sun 04-Aug	9:00	10:00	Unit 1	69.7°F	Day	8	4	5	0	1	0	9	1	0	0
Sun 04-Aug	10:00	11:00	Unit 1	69.9°F	Day	6	7	4	2	6	0	9	0	0	0
Sun 04-Aug	11:00	12:00	Unit 1	70.1°F	Day	3	5	2	1	2	0	4	1	0	0
Sun 04-Aug	12:00	13:00	Unit 1	70.6°F	Day	1	5	3	1	1	0	3	1	0	0
Sun 04-Aug					Sum 0500-1300		0		14		21		31		1
Sun 04-Aug	13:00	14:00	Unit 1	70.5°F	Day	4	0	2	1	2	0	3	0	0	0
Sun 04-Aug	14:00	15:00	Unit 1	69.8°F	Day	5	2	2	1	0	0	1	0	0	0
Sun 04-Aug	15:00	16:00	Unit 1	69.9°F	Day	2	4	1	0	5	2	3	1	1	0
Sun 04-Aug	16:00	17:00	Unit 1	70.5°F	Day	4	3	1	0	1	0	4	0	1	0
Sun 04-Aug	17:00	18:00	Unit 1	70.9°F	Day	0	1	2	0	0	0	3	0	0	0
Sun 04-Aug	18:00	19:00	Unit 1	71.1°F	Day	0	3	2	0	1	0	2	1	1	0
Sun 04-Aug	19:00	20:00	Unit 1	70.7°F	Day	1	2	1	0	1	0	0	0	1	1
Sun 04-Aug	20:00	21:00	Unit 1	70.5°F	Day	1	1	0	0	0	0	0	0	0	0
Sun 04-Aug					Sum 1300-2100		1		9		8		14		3
Sun 04-Aug					Day Total (FPC) = Sum 0500-2100 expanded by 1.2		1		28		35		54		5

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sun 04-Aug	21:00	22:00	Unit 1	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sun 04-Aug	22:00	23:00	Unit 1	70.1°F	Night Video	0	1	0	0	0	0	0	0	0	0
Sun 04-Aug	23:00	0:00	Unit 1	70.1°F	Night Video	0	1	0	0	0	0	0	0	0	0
Mon 05-Aug	0:00	1:00	Unit 1	70.3°F	Night Video	0	1	0	0	0	0	0	1	0	0
Mon 05-Aug	1:00	2:00	Unit 1	69.8°F	Night Video	0	0	0	0	0	0	1	0	0	0
Mon 05-Aug	2:00	3:00	Unit 1	69.7°F	Night Video	0	0	0	0	1	0	0	0	0	0
Mon 05-Aug	3:00	4:00	Unit 1	69.7°F	Night Video	0	0	0	0	0	0	0	0	0	1
Mon 05-Aug	4:00	5:00	Unit 1	70.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Mon 05-Aug					Sum Night		-3		0		1		0		-1
Mon 05-Aug	5:00	6:00	Unit 1	70.4°F	Day	0	1	0	0	0	0	0	0	0	0
Mon 05-Aug	6:00	7:00	Unit 1	70.1°F	Day	3	0	3	3	6	0	3	0	0	0
Mon 05-Aug	7:00	8:00	Unit 1	69.7°F	Day	5	1	3	0	6	0	10	1	0	0
Mon 05-Aug	8:00	9:00	Unit 1	73.4°F	Day	3	1	6	2	2	0	1	0	0	0
Mon 05-Aug	9:00	10:00	Unit 1	69.9°F	Day	6	3	2	1	1	1	2	0	0	0
Mon 05-Aug	10:00	11:00	Unit 1	70.1°F	Day	3	2	3	0	4	0	7	0	0	0
Mon 05-Aug	11:00	12:00	Unit 1	70.4°F	Day	7	6	2	1	6	1	9	7	0	0
Mon 05-Aug	12:00	13:00	Unit 1	70.2°F	Day	4	4	2	2	2	0	5	1	0	0
Mon 05-Aug					Sum 0500-1300		13		12		25		28		0
Mon 05-Aug	13:00	14:00	Unit 1	69.9°F	Day	6	8	4	2	3	1	1	1	0	0
Mon 05-Aug	14:00	15:00	Unit 1	70.4°F	Day	15	14	0	1	1	2	3	1	0	0
Mon 05-Aug	15:00	16:00	Unit 1	69.9°F	Day	8	0	0	2	3	0	3	0	1	0
Mon 05-Aug	16:00	17:00	Unit 1	70.0°F	Day	4	5	1	0	4	0	7	0	1	0
Mon 05-Aug	17:00	18:00	Spill ≤ TDG cap	70.4°F	Day	0	3	2	0	2	0	1	0	1	0
Mon 05-Aug	18:00	19:00	Spill ≤ TDG cap	69.9°F	Day	0	1	1	0	1	1	2	0	0	0
Mon 05-Aug	19:00	20:00	Spill ≤ TDG cap	70.1°F	Day	0	2	0	0	0	0	1	1	0	0
Mon 05-Aug	20:00	21:00	Spill ≤ TDG cap	69.6°F	Day	0	1	0	0	2	0	0	1	0	0
Mon 05-Aug					Sum 1300-2100		-1		3		12		14		3
Mon 05-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				14		18		44		50		4
Mon 05-Aug	21:00	22:00	Spill ≤ TDG cap	69.3°F	Night Video	0	0	0	0	0	0	0	1	0	0
Mon 05-Aug	22:00	23:00	Spill ≤ TDG cap	69.0°F	Night Video	0	0	0	0	0	0	1	0	0	0
Mon 05-Aug	23:00	0:00	Spill ≤ TDG cap	69.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 06-Aug	0:00	1:00	Spill ≤ TDG cap	69.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 06-Aug	1:00	2:00	Spill ≤ TDG cap	69.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Tue 06-Aug	2:00	3:00	Spill ≤ TDG cap	69.7°F	Night Video	0	1	0	0	0	0	0	0	0	0
Tue 06-Aug	3:00	4:00	Spill ≤ TDG cap	69.0°F	Night Video	0	0	0	0	0	0	0	1	0	0
Tue 06-Aug	4:00	5:00	Spill ≤ TDG cap	69.0°F	Night Video	0	0	0	0	0	0	2	2	0	0
Tue 06-Aug					Sum Night		-1		0		0		-1		0
Tue 06-Aug	5:00	6:00	Unit 1	69.8°F	Day	0	0	1	0	0	1	0	0	0	0
Tue 06-Aug	6:00	7:00	Unit 1	69.5°F	Day	1	0	1	0	8	1	5	0	0	1
Tue 06-Aug	7:00	8:00	Unit 1	69.5°F	Day	13	4	6	0	7	1	7	1	0	0
Tue 06-Aug	8:00	9:00	Unit 1	69.6°F	Day	16	2	5	1	6	0	4	0	0	0
Tue 06-Aug	9:00	10:00	Unit 1	69.9°F	Day	19	13	3	0	3	0	5	1	0	0
Tue 06-Aug	10:00	11:00	Unit 1	70.1°F	Day	11	15	3	4	8	2	5	0	0	0
Tue 06-Aug	11:00	12:00	Unit 1	70.1°F	Day	7	13	2	3	1	1	12	0	0	0
Tue 06-Aug	12:00	13:00	Unit 1	70.1°F	Day	4	5	4	0	2	0	5	1	2	0
Tue 06-Aug					Sum 0500-1300		19		17		29		40		1
Tue 06-Aug	13:00	14:00	Unit 1	69.8°F	Day	4	0	5	1	3	0	3	0	0	0
Tue 06-Aug	14:00	15:00	Unit 1	69.8°F	Day	20	11	3	0	2	1	10	0	1	0
Tue 06-Aug	15:00	16:00	Unit 1	70.0°F	Day	4	3	4	3	6	1	9	0	1	0
Tue 06-Aug	16:00	17:00	Unit 1	70.4°F	Day	6	2	1	3	8	2	7	1	1	0
Tue 06-Aug	17:00	18:00	Spill ≤ TDG cap	70.3°F	Day	6	7	0	2	2	0	15	2	0	0
Tue 06-Aug	18:00	19:00	Spill ≤ TDG cap	71.0°F	Day	2	3	2	3	2	0	4	2	0	0
Tue 06-Aug	19:00	20:00	Spill ≤ TDG cap	71.1°F	Day	0	1	0	0	1	3	4	2	0	0
Tue 06-Aug	20:00	21:00	Spill ≤ TDG cap	70.9°F	Day	1	0	1	0	0	2	4	0	0	0
Tue 06-Aug					Sum 1300-2100		16		4		15		49		3
Tue 06-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				42		25		53		107		5

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Tue 06-Aug	21:00	22:00	Spill ≤ TDG cap	70.4°F	Night Video	0	0	0	0	0	0	0	1	0	0
Tue 06-Aug	22:00	23:00	Spill ≤ TDG cap	70.1°F	Night Video	0	1	0	0	0	0	0	1	0	0
Tue 06-Aug	23:00	0:00	Spill ≤ TDG cap	70.2°F	Night Video	0	0	0	0	1	0	0	1	0	0
Wed 07-Aug	0:00	1:00	Spill ≤ TDG cap	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 07-Aug	1:00	2:00	Spill ≤ TDG cap	70.3°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 07-Aug	2:00	3:00	Spill ≤ TDG cap	70.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 07-Aug	3:00	4:00	Spill ≤ TDG cap	70.6°F	Night Video	0	0	0	0	0	0	1	0	0	0
Wed 07-Aug	4:00	5:00	Spill ≤ TDG cap	70.7°F	Night Video	0	0	0	0	0	0	2	0	0	0
Wed 07-Aug					Sum Night		-1		0		1		1		0
Wed 07-Aug	5:00	6:00	Unit 1	71.3°F	Day	0	0	1	0	1	0	2	1	0	0
Wed 07-Aug	6:00	7:00	Unit 1	70.5°F	Day	5	2	4	2	3	1	4	0	0	0
Wed 07-Aug	7:00	8:00	Unit 1	70.9°F	Day	2	3	6	0	6	0	8	1	2	1
Wed 07-Aug	8:00	9:00	Unit 1	70.9°F	Day	8	4	6	2	8	0	4	0	0	0
Wed 07-Aug	9:00	10:00	Unit 1	70.9°F	Day	7	0	2	2	5	0	5	1	0	0
Wed 07-Aug	10:00	11:00	Unit 1	70.9°F	Day	12	5	5	1	5	2	8	0	0	0
Wed 07-Aug	11:00	12:00	Unit 1	70.7°F	Day	10	7	4	2	2	0	6	0	0	0
Wed 07-Aug	12:00	13:00	Unit 1	70.5°F	Day	2	8	0	0	6	1	5	0	0	0
Wed 07-Aug					Sum 0500-1300		17		19		32		39		1
Wed 07-Aug	13:00	14:00	Unit 1	70.5°F	Day	8	2	1	1	2	0	4	1	0	0
Wed 07-Aug	14:00	15:00	Unit 1	70.7°F	Day	1	2	0	1	1	0	4	0	0	0
Wed 07-Aug	15:00	16:00	Unit 1	70.8°F	Day	5	6	0	1	3	0	8	0	0	0
Wed 07-Aug	16:00	17:00	Unit 1	71.1°F	Day	0	1	5	1	3	0	6	0	1	0
Wed 07-Aug	17:00	18:00	Spill ≤ TDG cap	70.3°F	Day	3	0	0	1	1	0	5	1	0	0
Wed 07-Aug	18:00	19:00	Spill ≤ TDG cap	71.4°F	Day	2	1	0	0	5	0	3	0	0	0
Wed 07-Aug	19:00	20:00	Spill ≤ TDG cap	70.7°F	Day	0	2	0	0	1	0	1	0	0	0
Wed 07-Aug	20:00	21:00	Spill ≤ TDG cap	70.3°F	Day	1	0	0	1	0	1	0	0	0	0
Wed 07-Aug					Sum 1300-2100		6		0		15		29		1
Wed 07-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				28		23		56		82		2
Wed 07-Aug	21:00	22:00	Spill ≤ TDG cap	70.3°F	Night Video	0	0	0	0	0	1	0	1	0	0
Wed 07-Aug	22:00	23:00	Spill ≤ TDG cap	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Wed 07-Aug	23:00	0:00	Spill ≤ TDG cap	70.4°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 08-Aug	0:00	1:00	Spill ≤ TDG cap	70.7°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 08-Aug	1:00	2:00	Spill ≤ TDG cap	70.5°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 08-Aug	2:00	3:00	Spill ≤ TDG cap	70.1°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 08-Aug	3:00	4:00	Spill ≤ TDG cap	69.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Thu 08-Aug	4:00	5:00	Spill ≤ TDG cap	69.8°F	Night Video	0	0	0	0	0	0	1	0	0	0
Thu 08-Aug					Sum Night		0		0		-1		0		0
Thu 08-Aug	5:00	6:00	Unit 1	69.9°F	Day	0	1	0	0	0	0	2	0	0	0
Thu 08-Aug	6:00	7:00	Unit 1	70.5°F	Day	1	0	3	1	2	0	1	0	0	0
Thu 08-Aug	7:00	8:00	Unit 1	70.5°F	Day	5	0	1	0	5	0	8	2	0	0
Thu 08-Aug	8:00	9:00	Unit 1	70.3°F	Day	8	2	4	1	0	0	8	1	0	0
Thu 08-Aug	9:00	10:00	Unit 1	70.5°F	Day	11	6	3	2	2	0	5	1	0	0
Thu 08-Aug	10:00	11:00	Unit 1	70.8°F	Day	3	2	0	0	2	1	4	2	0	0
Thu 08-Aug	11:00	12:00	Unit 1	70.7°F	Day	5	5	2	1	5	0	3	1	0	0
Thu 08-Aug	12:00	13:00	Unit 1	70.7°F	Day	6	1	2	0	6	0	4	2	0	0
Thu 08-Aug					Sum 0500-1300		22		10		21		26		0
Thu 08-Aug	13:00	14:00	Unit 1	70.6°F	Day	3	1	0	0	0	1	4	0	0	0
Thu 08-Aug	14:00	15:00	Unit 1	70.7°F	Day	6	1	2	0	5	1	5	0	1	0
Thu 08-Aug	15:00	16:00	Unit 1	70.9°F	Day	8	3	0	0	7	0	9	0	0	0
Thu 08-Aug	16:00	17:00	Unit 1	71.1°F	Day	6	2	1	0	6	0	3	0	0	0
Thu 08-Aug	17:00	18:00	Spill ≤ TDG cap	71.0°F	Day	2	1	2	0	1	0	2	0	0	0
Thu 08-Aug	18:00	19:00	Spill ≤ TDG cap	71.0°F	Day	3	1	0	0	1	0	2	1	0	0
Thu 08-Aug	19:00	20:00	Spill ≤ TDG cap	70.8°F	Day	1	2	0	0	1	0	0	1	0	0
Thu 08-Aug	20:00	21:00	Spill ≤ TDG cap	70.6°F	Day	0	1	0	0	0	0	0	0	0	0
Thu 08-Aug					Sum 1300-2100		17		5		19		23		1
Thu 08-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				47		18		48		59		1

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Thu 08-Aug	21:00	22:00	Spill ≤ TDG cap	70.6°F	Night Video	1	0	0	0	0	1	0	0	0	0
Thu 08-Aug	22:00	23:00	Spill ≤ TDG cap	70.6°F	Night Video	0	1	0	0	0	0	0	0	0	0
Thu 08-Aug	23:00	0:00	Spill ≤ TDG cap	70.6°F	Night Video	0	1	0	0	0	0	0	0	0	0
Fri 09-Aug	0:00	1:00	Spill ≤ TDG cap	70.6°F	Night Video	0	0	0	0	1	2	1	0	0	0
Fri 09-Aug	1:00	2:00	Spill ≤ TDG cap	70.5°F	Night Video	0	0	0	0	0	0	1	1	0	0
Fri 09-Aug	2:00	3:00	Spill ≤ TDG cap	70.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 09-Aug	3:00	4:00	Spill ≤ TDG cap	70.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 09-Aug	4:00	5:00	Spill ≤ TDG cap	70.3°F	Night Video	0	0	0	0	0	0	0	0	0	0
Fri 09-Aug					Sum Night		-1		0		-2		1		0
Fri 09-Aug	5:00	6:00	Unit 1	70.4°F	Day	1	1	0	0	0	0	0	0	0	0
Fri 09-Aug	6:00	7:00	Unit 1	69.7°F	Day	1	0	3	0	2	0	2	0	0	0
Fri 09-Aug	7:00	8:00	Unit 1	70.1°F	Day	5	2	4	1	7	3	3	0	0	0
Fri 09-Aug	8:00	9:00	Unit 1	70.1°F	Day	9	2	2	1	2	0	5	0	0	0
Fri 09-Aug	9:00	10:00	Unit 1	70.5°F	Day	7	1	4	1	4	0	2	1	1	0
Fri 09-Aug	10:00	11:00	Unit 1	70.5°F	Day	14	6	13	3	3	1	3	1	0	0
Fri 09-Aug	11:00	12:00	Unit 1	70.5°F	Day	4	1	13	5	5	2	8	0	1	0
Fri 09-Aug	12:00	13:00	Unit 1	70.4°F	Day	3	4	5	3	4	0	2	1	0	0
Fri 09-Aug					Sum 0500-1300		27		30		21		22		2
Fri 09-Aug	13:00	14:00	Unit 1	70.3°F	Day	5	8	4	3	5	1	2	0	0	0
Fri 09-Aug	14:00	15:00	Unit 1	70.3°F	Day	9	4	4	1	2	0	3	0	0	0
Fri 09-Aug	15:00	16:00	Unit 1	70.5°F	Day	4	4	4	2	7	2	6	0	0	0
Fri 09-Aug	16:00	17:00	Unit 1	70.4°F	Day	7	4	3	0	4	0	6	0	0	0
Fri 09-Aug	17:00	18:00	Spill ≤ TDG cap	70.2°F	Day	2	1	1	0	1	0	4	1	0	0
Fri 09-Aug	18:00	19:00	Spill ≤ TDG cap	69.5°F	Day	2	3	1	1	1	0	0	0	0	0
Fri 09-Aug	19:00	20:00	Spill ≤ TDG cap	69.9°F	Day	0	0	0	2	1	0	1	0	0	0
Fri 09-Aug	20:00	21:00	Spill ≤ TDG cap	69.8°F	Day	0	2	0	0	0	0	0	0	0	0
Fri 09-Aug					Sum 1300-2100		3		8		18		21		0
Fri 09-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				36		46		47		52		2
Fri 09-Aug	21:00	22:00	Spill ≤ TDG cap	69.8°F	Night Video	0	1	0	0	0	0	0	0	0	0
Fri 09-Aug	22:00	23:00	Spill ≤ TDG cap	69.9°F	Night Video	0	0	0	0	0	0	1	0	0	0
Fri 09-Aug	23:00	0:00	Spill ≤ TDG cap	69.9°F	Night Video	0	2	0	1	0	0	0	0	0	0
Sat 10-Aug	0:00	1:00	Spill ≤ TDG cap	69.1°F	Night Video	0	0	0	1	0	0	0	0	0	0
Sat 10-Aug	1:00	2:00	Spill ≤ TDG cap	69.0°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 10-Aug	2:00	3:00	Spill ≤ TDG cap	69.0°F	Night Video	0	0	0	0	0	0	0	1	0	0
Sat 10-Aug	3:00	4:00	Spill ≤ TDG cap	69.3°F	Night Video	1	1	0	0	1	0	0	0	0	0
Sat 10-Aug	4:00	5:00	Spill ≤ TDG cap	68.9°F	Night Video	3	2	0	0	0	0	1	0	0	0
Sat 10-Aug					Sum Night		-2		-2		1		1		0
Sat 10-Aug	5:00	6:00	Unit 1	69.0°F	Day	0	0	0	0	0	0	0	0	0	0
Sat 10-Aug	6:00	7:00	Unit 1	70.2°F	Day	4	2	0	0	5	0	0	0	0	0
Sat 10-Aug	7:00	8:00	Unit 1	69.8°F	Day	2	4	1	0	1	0	5	0	0	0
Sat 10-Aug	8:00	9:00	Unit 1	69.8°F	Day	12	4	7	1	4	0	8	1	0	0
Sat 10-Aug	9:00	10:00	Unit 1 / End of Op	68.9°F	Day	7	2	4	2	6	0	7	1	0	0
Sat 10-Aug	10:00	11:00	Roof work begins	69.2°F	Day	5	2	2	0	6	1	6	0	0	0
Sat 10-Aug	11:00	12:00	Station service + spill	69.0°F	Day	3	2	2	0	2	0	3	0	0	0
Sat 10-Aug	12:00	13:00	Station service + spill	69.2°F	Day	2	2	2	0	1	0	1	0	0	0
Sat 10-Aug					Sum 0500-1300		17		15		24		28		0
Sat 10-Aug	13:00	14:00	Station service + spill	69.4°F	Day	4	4	4	0	0	0	2	0	0	0
Sat 10-Aug	14:00	15:00	Station service + spill	69.1°F	Day	5	1	1	1	0	0	2	0	0	0
Sat 10-Aug	15:00	16:00	Station service + spill	69.2°F	Day	4	1	2	0	0	0	2	0	0	0
Sat 10-Aug	16:00	17:00	Station service + spill	69.4°F	Day	0	3	2	1	3	0	2	0	0	0
Sat 10-Aug	17:00	18:00	Station service + spill	68.7°F	Day	1	1	0	0	1	0	0	0	1	0
Sat 10-Aug	18:00	19:00	Station service + spill	68.7°F	Day	0	0	0	0	0	0	3	0	0	0
Sat 10-Aug	19:00	20:00	Station service + spill	69.0°F	Day	1	2	0	0	0	0	3	0	1	1
Sat 10-Aug	20:00	21:00	Station service + spill	68.9°F	Day	0	0	0	0	0	0	0	0	0	0
Sat 10-Aug					Sum 1300-2100		3		7		4		14		1
Sat 10-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2				24		26		34		50		1

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 10-Aug	21:00	22:00	Station service + spill	68.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 10-Aug	22:00	23:00	Station service + spill	67.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sat 10-Aug	23:00	0:00	FPP Unit 2	67.9°F	Night Video	0	0	0	0	0	0	1	0	0	0
Sun 11-Aug	0:00	1:00	FPP Unit 2	68.2°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sun 11-Aug	1:00	2:00	FPP Unit 2	68.3°F	Night Video	0	0	0	0	4	4	0	0	0	0
Sun 11-Aug	2:00	3:00	FPP Unit 2	68.6°F	Night Video	0	0	0	1	0	0	0	0	0	0
Sun 11-Aug	3:00	4:00	FPP Unit 2	68.7°F	Night Video	0	0	0	0	1	0	0	0	0	0
Sun 11-Aug	4:00	5:00	FPP Unit 2	69.0°F	Night Video	0	0	0	1	0	0	0	0	0	0
Sun 11-Aug					Sum Night	0		-2		1		1		0	
Sun 11-Aug	5:00	6:00	FPP Unit 2	68.6°F	Day	0	0	0	0	0	0	0	0	0	0
Sun 11-Aug	6:00	7:00	FPP Unit 2	69.0°F	Day	2	0	1	0	3	0	4	0	0	0
Sun 11-Aug	7:00	8:00	FPP Unit 2	68.9°F	Day	4	2	2	0	4	0	6	0	0	0
Sun 11-Aug	8:00	9:00	FPP Unit 2	69.1°F	Day	4	1	0	0	3	0	8	0	0	0
Sun 11-Aug	9:00	10:00	FPP Unit 2	68.7°F	Day	4	2	0	0	1	0	4	0	0	0
Sun 11-Aug	10:00	11:00	Station service + spill	68.6°F	Day	3	1	1	0	4	0	7	0	0	0
Sun 11-Aug	11:00	12:00	Station service + spill	68.3°F	Day	8	1	0	0	0	0	2	0	0	0
Sun 11-Aug	12:00	13:00	Station service + spill	68.6°F	Day	1	4	0	0	1	0	1	1	0	0
Sun 11-Aug					Sum 0500-1300	15		4		16		31		0	
Sun 11-Aug	13:00	14:00	Station service + spill	68.8°F	Day	0	0	1	0	1	0	2	0	1	0
Sun 11-Aug	14:00	15:00	Station service + spill	68.7°F	Day	2	0	2	0	2	1	4	0	0	0
Sun 11-Aug	15:00	16:00	Station service + spill	68.8°F	Day	3	1	2	0	1	0	2	0	0	0
Sun 11-Aug	16:00	17:00	Station service + spill	68.7°F	Day	4	0	0	1	4	0	9	0	0	0
Sun 11-Aug	17:00	18:00	Station service + spill	69.0°F	Day	3	2	3	1	2	0	3	0	0	0
Sun 11-Aug	18:00	19:00	Station service + spill	68.7°F	Day	1	3	0	0	2	0	2	0	1	0
Sun 11-Aug	19:00	20:00	Station service + spill	68.4°F	Day	3	4	0	0	2	0	1	0	1	0
Sun 11-Aug	20:00	21:00	Station service + spill	68.8°F	Day	0	1	0	0	0	0	2	0	0	1
Sun 11-Aug					Sum 1300-2100	5		6		13		25		2	
Sun 11-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			24		12		35		67		2	
Sun 11-Aug	21:00	22:00	FPP Unit 2	68.4°F	Night Video	0	1	0	0	0	0	2	0	0	0
Sun 11-Aug	22:00	23:00	FPP Unit 2	68.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Sun 11-Aug	23:00	0:00	FPP Unit 2	68.9°F	Night Video	0	0	0	0	0	0	0	0	0	0
Mon 12-Aug	0:00	1:00	FPP Unit 2	68.6°F	Night Video	1	0	0	0	0	0	1	0	0	0
Mon 12-Aug	1:00	2:00	FPP Unit 2	68.9°F	Night Video	0	0	0	0	0	0	1	0	0	0
Mon 12-Aug	2:00	3:00	FPP Unit 2	68.5°F	Night Video	0	0	0	1	0	0	1	0	0	0
Mon 12-Aug	3:00	4:00	FPP Unit 2	68.6°F	Night Video	0	0	0	0	0	0	0	0	0	0
Mon 12-Aug	4:00	5:00	FPP Unit 2	69.0°F	Night Video	0	0	0	0	0	0	0	0	0	0
Mon 12-Aug					Sum Night	0		-1		0		5		0	
Mon 12-Aug	5:00	6:00	FPP Unit 2	68.9°F	Day	0	0	0	0	0	0	0	0	0	0
Mon 12-Aug	6:00	7:00	Station service + spill	68.7°F	Day	1	2	1	0	1	0	2	0	0	0
Mon 12-Aug	7:00	8:00	Station service + spill	68.4°F	Day	3	1	3	0	1	0	9	0	1	0
Mon 12-Aug	8:00	9:00	Station service + spill	68.7°F	Day	8	1	1	0	6	2	5	0	0	0
Mon 12-Aug	9:00	10:00	Station service + spill		Day	2	0	1	0	2	0	6	0	0	0
Mon 12-Aug	10:00	11:00	Station service + spill		Day	4	1	1	0	2	0	9	0	0	0
Mon 12-Aug	11:00	12:00	Station service + spill		Day	7	0	0	0	3	0	4	0	0	0
Mon 12-Aug	12:00	13:00	Station service + spill		Day	3	1	0	1	4	0	5	0	0	0
Mon 12-Aug					Sum 0500-1300	22		6		17		40		1	
Mon 12-Aug	13:00	14:00	Station service + spill		Day	8	2	4	1	3	1	5	0	1	0
Mon 12-Aug	14:00	15:00	Station service + spill		Day	8	6	0	2	3	0	4	0	0	0
Mon 12-Aug	15:00	16:00	Station service + spill		Day	7	4	1	1	2	0	4	0	0	0
Mon 12-Aug	16:00	17:00	Station service + spill		Day	4	2	3	0	7	1	4	0	0	0
Mon 12-Aug	17:00	18:00	Station service + spill		Day	7	4	1	0	5	0	10	0	1	0
Mon 12-Aug	18:00	19:00	Station service + spill		Day	5	6	1	0	3	0	3	0	0	0
Mon 12-Aug	19:00	20:00	Station service + spill		Day	0	2	0	0	1	0	1	0	0	0
Mon 12-Aug	20:00	21:00	Station service + spill		Day	0	0	0	0	1	0	1	0	0	0
Mon 12-Aug					Sum 1300-2100	13		6		23		32		2	
Mon 12-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			42		14		48		86		4	

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 22, 2013					
	GROSS	STA	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG	SUPR	UNIT	STATUS		
	GEN	USE	--	IN KCFS	--	IN FEET + MSL		HEAD	CAP	ON	ON	LWSI	
	MW	MW	TOTAL	POWER	SPILL	FOREBAY	TAILWATR	FT	MW	RMT	LINE	AVL	GAGE
													ELEV
1		1	25.50	11.80	13.40	735.42	633.09	102.33					735.46
2		1	27.20	11.80	13.50	735.45	633.29	102.16					735.46
3		1	25.60	11.80	13.50	735.46	633.07	102.39					735.46
4		2	25.70	11.90	13.50	735.47	633.03	102.44					735.46
5		1	25.70	11.90	13.50	735.48	633.09	102.39					735.46
6		1	25.80	12.00	13.60	735.54	633.05	102.49					735.46
7		1	25.80	11.90	13.60	735.58	632.97	102.61					735.46
8		1	30.70	12.00	18.30	735.50	633.50	102.00					735.46
9		1	30.70	12.00	18.50	735.51	633.36	102.15					735.46
10		1	30.60	11.90	18.50	735.48	633.44	102.04					735.46
11		1	30.80	12.00	18.50	735.43	633.50	101.93					735.46
12		1	30.80	12.00	18.50	735.43	633.47	101.96					735.52
13		1	28.70	11.90	16.50	735.42	633.25	102.17					735.52
14		1	28.60	11.80	16.50	735.36	633.26	102.10					735.52
15		2	28.50	11.80	16.50	735.36	633.22	102.14					735.52
16		2	28.60	11.80	16.50	735.39	633.29	102.10					735.52
17		2	25.80	15.00	10.50	735.40	633.34	102.06					735.52
18		1	24.00	16.80	6.90	735.40	633.32	102.08					735.51
19		1	24.00	16.90	6.90	735.45	633.38	102.07					735.51
20		1	24.10	16.90	6.90	735.47	633.25	102.22					735.51
21		1	24.10	16.90	6.90	735.52	633.27	102.25					735.51
22		1	25.80	16.90	6.90	735.55	633.48	102.07					735.51
23		1	24.00	16.90	6.90	735.59	633.26	102.33					735.51
24		1	24.00	16.90	6.90	735.60	633.21	102.39					735.51
TOT		35											
AVG		1	26.88	13.48	12.99	735.47	633.27	102.20					735.49
MAX			30.80	16.90	18.50	735.60	633.50	102.61					735.52
MIN			24.00	11.80	6.90	735.36	632.97	101.93					735.46

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Tuesday July 23, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	25.70	16.80	6.90	735.63	633.56	102.07				735.51
2		1	24.00	16.80	6.90	735.65	633.20	102.45				735.51
3		1	24.20	16.90	7.10	735.66	633.27	102.39				735.51
4		1	27.30	16.90	10.10	735.67	633.24	102.43				735.51
5		1	27.50	17.00	10.20	735.71	632.92	102.79				735.51
6		1	27.50	16.90	10.30	735.72	633.16	102.56				735.51
7		1	27.40	16.90	10.30	735.75	633.11	102.64				735.51
8		1	27.90	17.30	10.40	735.72	633.00	102.72				735.51
9		2	27.30	11.90	15.10	735.77	633.09	102.68				735.74
10		1	27.20	11.80	15.10	735.78	633.07	102.71				735.74
11		1	27.20	11.80	15.10	735.76	633.10	102.66				735.74
12		1	27.00	11.60	15.10	735.77	633.12	102.65				735.74
13		1	27.20	11.70	15.20	735.72	633.08	102.64				735.74
14		2	26.90	11.60	15.10	735.75	633.10	102.65				735.74
15		2	27.10	11.70	15.00	735.71	633.15	102.56				735.74
16		2	28.70	11.60	15.10	735.70	633.26	102.44				735.74
17		2	27.20	11.70	15.10	735.72	633.07	102.65				735.74
18		1	27.10	11.70	15.20	735.74	633.10	102.64				735.74
19		1	26.70	11.20	15.20	735.71	633.12	102.59				735.74
20		1	30.30	5.00	25.00	735.65	633.13	102.52				735.74
21		1	30.60	5.00	25.30	735.62	633.12	102.50				735.74
22		1	30.40	5.00	25.10	735.57	633.11	102.46				735.74
23		1	30.30	5.00	25.00	735.54	633.23	102.31				735.74
24		1	28.20	5.00	22.90	735.54	633.30	102.24				735.74
TOT		35										
AVG		1	27.54	12.03	15.07	735.69	633.15	102.54				735.66
MAX			30.60	17.30	25.30	735.78	633.56	102.79				735.74
MIN			24.00	5.00	6.90	735.54	632.92	102.07				735.51

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM		Wednesday July 24, 2013			
	GROSS GEN MW	STA USE MW	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS		LWSI GAGE ELEV
			-- TOTAL	IN POWER	-- SPILL	IN FEET +	MSL TAILWATR				ON LINE	AVL	
	1	1	28.20	5.00	22.90	735.52	633.33	102.19					735.74
	2	1	28.00	5.00	22.70	735.52	633.35	102.17					735.74
	3	1	27.90	5.00	22.60	735.53	633.37	102.16					735.74
	4	1	28.00	5.00	22.70	735.52	633.43	102.09					735.74
	5	1	28.10	5.00	22.80	735.52	633.37	102.15					735.74
	6	1	29.60	7.00	22.30	735.51	633.43	102.08					735.74
	7	1	26.90	16.90	9.60	735.56	633.52	102.04					735.74
	8	1	27.20	17.00	10.00	735.54	633.43	102.11					735.74
	9	1	27.40	17.10	10.00	735.56	633.61	101.95					735.74
	10	1	27.40	17.10	10.00	735.58	633.48	102.10					735.74
	11	1	27.40	17.10	10.00	735.56	633.24	102.32					735.74
	12	1	27.30	17.10	9.90	735.56	633.38	102.18					735.74
	13	1	29.00	17.10	9.90	735.58	633.36	102.22					735.74
	14	1	27.10	17.00	9.80	735.54	633.09	102.45					735.74
	15	2	27.20	17.10	9.90	735.54	633.21	102.33					735.74
	16	1	27.30	17.00	10.00	735.57	633.20	102.37					735.74
	17	1	27.30	17.00	10.00	735.59	633.25	102.34					735.74
	18	1	26.90	16.40	10.20	735.58	633.17	102.41					735.74
	19	1	28.70	5.00	23.40	735.56	633.19	102.37					735.74
	20	1	28.70	5.00	23.40	735.54	633.22	102.32					735.74
	21	1	28.70	5.00	23.40	735.52	633.29	102.23					735.74
	22	2	28.70	5.00	23.40	735.50	633.26	102.24					735.74
	23	1	28.70	5.00	23.40	735.47	633.32	102.15					735.74
	24	1	28.70	5.00	23.40	735.48	633.39	102.09					735.74
TOT		35											
AVG		1	27.93	11.08	16.49	735.54	633.33	102.21					735.74
MAX			29.60	17.10	23.40	735.59	633.61	102.45					735.74
MIN			26.90	5.00	9.60	735.47	633.09	101.95					735.74

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Thursday July 25, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		1	28.60	5.00	23.30	735.46	633.32	102.14				735.74
2		1	28.50	5.00	23.20	735.44	633.37	102.07				735.74
3		1	28.50	5.00	23.20	735.43	633.31	102.12				735.74
4		1	28.50	5.00	23.20	735.42	633.38	102.04				735.74
5		1	26.40	5.00	21.10	735.41	633.31	102.10				735.74
6		1	26.60	5.00	21.30	735.37	633.40	101.97				735.74
7		1	27.50	16.60	10.60	735.39	633.50	101.89				735.74
8		2	27.60	17.10	10.20	735.38	633.48	101.90				735.74
9		2	27.60	17.10	10.10	735.37	633.57	101.80				735.74
10		2	29.20	17.00	10.10	735.35	633.21	102.14				735.74
11		2	28.60	18.20	10.10	735.34	633.47	101.87				735.74
12		2	27.30	17.00	10.00	735.35	633.49	101.86				735.74
13		2	27.30	17.00	10.00	735.29	633.24	102.05				735.74
14		2	27.30	17.00	10.00	735.28	633.43	101.85				735.74
15		2	33.60	23.40	9.90	735.24	633.73	101.51				735.74
16		2	27.20	17.00	9.90	735.23	633.30	101.93				735.74
17		2	27.30	17.20	9.90	735.21	633.35	101.86				735.49
18		2	27.70	17.50	9.90	735.05	633.29	101.76				735.49
19		2	22.40	12.20	9.90	735.21	633.13	102.08				735.49
20		2	22.20	11.90	9.90	735.22	633.40	101.82				735.49
21		2	22.30	12.00	9.90	735.22	633.15	102.07				735.49
22		2	22.20	12.00	10.00	735.30	633.00	102.30				735.49
23		2	23.30	11.90	11.10	735.28	633.12	102.16				735.49
24		2	25.40	11.90	13.20	735.28	632.81	102.47				735.49
TOT		37										
AVG		2	26.80	13.08	13.33	735.31	633.32	101.99				735.66
MAX			33.60	23.40	23.30	735.46	633.73	102.47				735.74
MIN			22.20	5.00	9.90	735.05	632.81	101.51				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Friday July 26, 2013				
	GROSS GEN MW	STA USE MW	-----		OUTFLOW	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT STATUS		LWSI GAGE ELEV
			--	IN KCFS	--	IN FEET + MSL	ON			ON		
			TOTAL	POWER	SPILL	FOREBAY	TAILWATR			RMT	LINE	
1		2	25.30	11.90	13.10	735.32	632.72	102.60				735.49
2		2	25.40	12.00	13.10	735.31	632.99	102.32				735.49
3		2	27.00	11.90	13.10	735.26	632.89	102.37				735.49
4		2	25.30	11.80	13.20	735.30	632.60	102.70				735.49
5		2	25.60	11.90	13.30	735.33	632.84	102.49				735.49
6		2	25.50	11.80	13.40	735.38	632.74	102.64				735.49
7		2	29.60	11.90	17.30	735.35	633.16	102.19				735.49
8		2	30.70	12.10	18.30	735.39	633.24	102.15				735.49
9		2	30.60	11.90	18.30	735.40	633.11	102.29				735.49
10		2	30.60	12.00	18.30	735.35	633.30	102.05				735.49
11		2	30.50	11.90	18.30	735.35	633.28	102.07				735.49
12		2	30.40	11.90	18.20	735.35	633.29	102.06				735.49
13		2	30.50	12.00	18.20	735.28	633.46	101.82				735.49
14		2	30.60	12.00	18.30	735.28	633.44	101.84				735.49
15		2	30.50	12.00	18.20	735.24	633.44	101.80				735.49
16		2	30.50	12.10	16.50	735.24	633.07	102.17				735.49
17		1	23.60	12.00	11.30	735.24	633.24	102.00				735.49
18		1	23.50	11.90	11.30	735.22	633.39	101.83				735.49
19		2	23.60	12.00	11.30	735.25	633.07	102.18				735.49
20		2	23.60	12.00	11.30	735.28	633.22	102.06				735.49
21		2	23.60	12.00	11.30	735.25	633.35	101.90				735.49
22		2	23.70	12.10	11.20	735.29	633.15	102.14				735.49
23		2	23.50	11.90	11.20	735.33	633.16	102.17				735.49
24		2	23.40	11.90	11.20	735.34	633.37	101.97				735.49
TOT		38										
AVG		2	26.96	11.95	14.55	735.31	633.15	102.16				735.49
MAX			30.70	12.10	18.30	735.40	633.46	102.70				735.49
MIN			23.40	11.80	11.20	735.22	632.60	101.80				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Saturday July 27, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	23.30	12.00	11.00	735.32	633.26	102.06				735.49
2		2	23.40	11.90	11.20	735.35	633.24	102.11				735.49
3		2	23.50	12.00	11.20	735.35	633.40	101.95				735.49
4		2	23.60	12.10	11.20	735.37	633.33	102.04				735.49
5		2	23.50	12.00	11.20	735.42	633.27	102.15				735.49
6		2	23.50	11.90	11.20	735.46	633.37	102.09				735.49
7		1	23.50	11.90	11.30	735.50	633.36	102.14				735.49
8		1	23.60	11.90	11.30	735.56	633.32	102.24				735.49
9		1	23.70	12.00	11.30	735.58	633.43	102.15				735.49
10		1	24.70	13.40	11.00	735.61	633.38	102.23				735.49
11		2	25.80	17.20	8.30	735.57	633.50	102.07				735.49
12		2	27.50	17.20	8.30	735.61	633.72	101.89				735.49
13		2	25.80	17.20	8.30	735.56	633.50	102.06				735.49
14		2	25.80	17.20	8.30	735.56	633.52	102.04				735.49
15		2	25.80	17.30	8.20	735.57	633.81	101.76				735.49
16		2	27.50	17.20	8.20	735.56	633.64	101.92				735.49
17		2	25.70	17.20	8.30	735.57	633.53	102.04				735.49
18		2	25.70	17.20	8.30	735.56	633.63	101.93				735.49
19		2	25.80	17.20	8.30	735.54	633.40	102.14				735.49
20		2	25.60	17.10	8.20	735.52	633.35	102.17				735.49
21		2	25.50	17.10	8.10	735.50	633.56	101.94				735.49
22		2	25.40	17.10	8.00	735.49	633.44	102.05				735.49
23		2	25.50	17.10	8.10	735.46	633.50	101.96				735.49
24		2	25.60	17.10	8.10	735.43	633.57	101.86				735.49
TOT		38										
AVG		2	24.97	15.06	9.45	735.50	633.46	102.04				735.49
MAX			27.50	17.30	11.30	735.61	633.81	102.24				735.49
MIN			23.30	11.90	8.00	735.32	633.24	101.76				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Sunday July 28, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.60	17.20	8.10	735.42	633.53	101.89				735.49
2		2	25.70	17.20	8.20	735.39	633.48	101.91				735.49
3		2	25.80	17.20	8.30	735.35	633.60	101.75				735.49
4		2	25.70	17.10	8.30	735.37	633.50	101.87				735.49
5		2	25.60	17.20	8.10	735.37	633.50	101.87				735.49
6		2	25.60	17.20	8.20	735.35	633.55	101.80				735.49
7		2	25.60	17.10	8.20	735.37	633.41	101.96				735.50
8		2	25.50	17.10	8.20	735.39	633.58	101.81				735.50
9		2	25.50	17.10	8.10	735.39	633.49	101.90				735.50
10		2	25.50	17.10	8.10	735.39	633.59	101.80				735.50
11		2	25.60	17.20	8.10	735.39	633.56	101.83				735.50
12		2	25.50	17.00	8.10	735.39	633.57	101.82				735.50
13		2	27.00	16.90	8.10	735.37	633.53	101.84				735.50
14		2	25.40	17.00	8.10	735.32	633.39	101.93				735.50
15		2	25.40	17.00	8.10	735.32	633.30	102.02				735.50
16		2	25.40	16.90	8.10	735.33	633.47	101.86				735.50
17		2	25.30	16.90	8.10	735.35	633.41	101.94				735.50
18		2	25.40	17.00	8.10	735.32	633.46	101.86				735.50
19		2	25.30	17.00	8.00	735.29	633.48	101.81				735.50
20		2	25.30	17.00	8.00	735.27	633.49	101.78				735.50
21		2	25.20	17.00	8.00	735.24	633.44	101.80				735.50
22		2	25.40	17.10	7.90	735.21	633.50	101.71				735.50
23		2	25.40	17.10	7.90	735.20	633.43	101.77				735.50
24		2	25.30	17.00	8.00	735.18	633.40	101.78				735.50
TOT		38										
AVG		2	25.54	17.07	8.10	735.33	633.49	101.85				735.50
MAX			27.00	17.20	8.30	735.42	633.60	102.02				735.50
MIN			25.20	16.90	7.90	735.18	633.30	101.71				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday July 29, 2013				
	GROSS GEN MW	STA USE MW	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT STATUS		LWSI GAGE ELEV
			--	IN KCFS	--	IN FEET + MSL	TAILWATR			ON	ON	
			TOTAL	POWER	SPILL	FOREBAY				RMT	LINE	
1		2	25.40	17.00	8.00	735.15	633.46	101.69				735.50
2		2	25.50	17.10	8.10	735.10	633.36	101.74				735.50
3		2	24.90	17.00	7.60	735.10	633.41	101.69				735.50
4		2	24.20	17.10	6.80	735.08	633.50	101.58				735.50
5		2	24.30	17.20	6.80	735.07	633.43	101.64				735.50
6		2	24.30	17.10	6.80	735.08	633.43	101.65				735.48
7		2	24.30	17.20	6.80	735.11	633.44	101.67				735.48
8		2	24.30	17.10	6.80	735.14	633.41	101.73				735.48
9		2	24.10	17.00	6.80	735.18	633.35	101.83				735.48
10		2	24.30	17.10	6.80	735.21	633.27	101.94				735.48
11		2	24.20	17.10	6.90	735.22	633.31	101.91				735.48
12		2	20.80	11.70	7.40	735.31	633.38	101.93				735.49
13		2	21.40	11.40	7.90	735.32	633.44	101.88				735.49
14		2	19.80	11.40	8.10	735.33	633.50	101.83				735.50
15		2	20.60	12.20	8.10	735.39	633.36	102.03				735.50
16		2	20.50	12.10	8.10	735.43	633.40	102.03				735.50
17		2	20.50	12.30	7.90	735.45	633.44	102.01				735.49
18		2	20.40	12.10	8.00	735.49	633.34	102.15				735.53
19		2	20.50	12.20	8.00	735.50	633.37	102.13				
20		2	20.40	12.10	8.00	735.52	633.40	102.12				735.55
21		2	20.40	12.10	8.00	735.54	633.33	102.21				735.57
22		2	20.30	12.00	8.00	735.56	633.37	102.19				735.55
23		2	20.30	12.00	8.00	735.58	633.36	102.22				735.53
24		2	21.60	11.60	8.00	735.60	633.36	102.24				735.52
TOT		39										
AVG		2	22.39	14.30	7.57	735.31	633.39	101.92				735.50
MAX			25.50	17.20	8.10	735.60	633.50	102.24				735.57
MIN			19.80	11.40	6.80	735.07	633.27	101.58				735.48

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Tuesday July 30, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	19.80	11.50	8.00	735.61	633.37	102.24				735.55
2		2	20.10	11.70	8.00	735.64	633.36	102.28				735.57
3		2	20.00	11.60	8.10	735.69	633.37	102.32				735.58
4		2	20.10	11.70	8.10	735.72	633.37	102.35				735.64
5		2	20.00	11.60	8.10	735.78	633.39	102.39				735.70
6		2	24.10	11.60	12.20	735.79	632.89	102.90				735.80
7		2	25.70	11.50	13.90	735.82	632.76	103.06				735.80
8		2	25.70	11.60	13.90	735.86	632.80	103.06				735.81
9		2	25.70	11.60	13.80	735.85	632.86	102.99				735.84
10		2	25.90	11.70	13.90	735.86	632.84	103.02				735.86
11		2	27.30	12.90	14.10	735.88	632.80	103.08				735.82
12		2	26.20	11.50	14.50	735.80	632.96	102.84				735.81
13		2	27.20	11.30	15.50	735.81	633.00	102.81				735.87
14		2	27.20	11.40	15.50	735.79	633.00	102.79				735.82
15		2	27.40	11.50	15.60	735.76	633.07	102.69				735.81
16		2	27.40	11.60	15.50	735.71	633.07	102.64				735.79
17		2	29.00	11.60	15.30	735.70	633.17	102.53				735.72
18		2	27.20	11.60	15.30	735.67	633.14	102.53				735.69
19		2	27.20	11.60	15.30	735.56	633.14	102.42				735.66
20		2	27.00	11.40	15.30	735.60	633.39	102.21				735.59
21		2	27.30	11.70	15.30	735.52	633.17	102.35				735.56
22		2	27.10	11.60	15.20	735.48	633.14	102.34				735.52
23		2	28.30	11.60	14.70	735.46	633.22	102.24				735.51
24		2	23.90	11.60	12.00	735.43	633.17	102.26				735.51
TOT		40										
AVG		2	25.28	11.62	13.21	735.70	633.10	102.60				735.70
MAX			29.00	12.90	15.60	735.88	633.39	103.08				735.87
MIN			19.80	11.30	8.00	735.43	632.76	102.21				735.51

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG	LOWER GRANITE DAM	Wednesday July 31, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	23.90	11.60	12.00	735.42	633.29	102.13				735.50
2		2	23.90	11.60	12.00	735.41	633.54	101.87				735.50
3		2	24.10	11.70	12.10	735.39	633.17	102.22				735.50
4		2	24.10	11.70	12.10	735.39	633.25	102.14				735.50
5		2	24.00	11.60	12.10	735.39	633.33	102.06				735.50
6		2	24.10	11.60	12.10	735.45	633.09	102.36				735.49
7		2	24.30	11.70	12.30	735.49	633.19	102.30				735.50
8		2	24.20	11.60	12.30	735.52	633.18	102.34				735.50
9		2	24.20	11.50	12.30	735.57	633.07	102.50				735.54
10		2	24.30	11.70	12.30	735.62	633.19	102.43				735.56
11		2	24.20	11.50	12.40	735.61	633.17	102.44				735.62
12		2	27.60	17.20	10.10	735.59	633.29	102.30				735.68
13		2	28.90	16.90	10.00	735.68	633.39	102.29				735.66
14		2	27.10	17.00	9.80	735.65	633.39	102.26				735.65
15		2	27.90	17.80	9.80	735.52	633.60	101.92				735.69
16		2	28.60	19.60	8.70	735.57	633.70	101.87				735.68
17		2	24.50	16.90	7.30	735.58	633.56	102.02				735.59
18		2	24.20	17.00	6.90	735.47	633.89	101.58				735.64
19		2	24.10	17.00	6.90	735.52	633.53	101.99				735.71
20		2	24.20	17.00	6.90	735.52	633.37	102.15				735.66
21		2	24.10	16.90	6.90	735.52	633.58	101.94				735.53
22		2	24.10	16.90	6.90	735.47	633.46	102.01				735.54
23		2	24.10	16.90	6.90	735.46	633.43	102.03				735.53
24		2	24.10	16.90	6.90	735.46	633.54	101.92				735.50
TOT		40										
AVG		2	24.95	14.66	9.92	735.51	633.38	102.13				735.57
MAX			28.90	19.60	12.40	735.68	633.89	102.50				735.71
MIN			23.90	11.50	6.90	735.39	633.07	101.58				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM Thursday August 1, 2013					
	GROSS GEN MW	STA USE MW	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS		LWSI GAGE ELEV
			--	IN KCFS	--	IN FEET + MSL	TAILWATR				ON	ON	
			TOTAL	POWER	SPILL	FOREBAY					LINE	AVL	
1		2	24.00	16.90	6.90	735.45	633.46	101.99					735.50
2		2	24.10	16.90	6.90	735.43	633.53	101.90					735.50
3		2	24.10	16.90	6.90	735.43	633.57	101.86					735.50
4		2	24.10	16.90	6.90	735.41	633.52	101.89					735.50
5		2	24.10	16.90	6.90	735.39	633.58	101.81					735.51
6		2	24.10	16.90	6.90	735.39	633.55	101.84					735.51
7		2	24.10	16.90	6.90	735.43	633.44	101.99					735.51
8		2	24.00	16.80	6.90	735.47	633.44	102.03					735.50
9		2	25.80	16.90	6.90	735.35	633.43	101.92					735.55
10		2	23.90	16.80	6.90	735.51	633.34	102.17					735.55
11		2	24.10	16.90	6.90	735.59	633.55	102.04					735.52
12		2	24.10	16.90	6.90	735.58	633.48	102.10					735.62
13		2	24.10	16.90	6.90	735.65	633.43	102.22					735.64
14		2	24.10	16.90	6.90	735.64	633.68	101.96					735.65
15		2	24.10	17.00	6.90	735.58	633.49	102.09					735.72
16		2	24.00	16.90	6.90	735.61	633.53	102.08					735.74
17		2	24.10	16.90	6.90	735.63	633.75	101.88					735.71
18		2	24.10	16.90	6.90	735.63	633.50	102.13					735.66
19		2	24.10	16.90	6.90	735.64	633.60	102.04					735.60
20		2	24.00	16.90	6.90	735.63	633.75	101.88					735.61
21		2	24.10	16.90	6.90	735.61	633.44	102.17					735.60
22		2	24.10	16.90	6.90	735.63	633.61	102.02					735.60
23		2	24.10	17.00	6.90	735.63	633.76	101.87					735.56
24		2	24.20	17.00	6.90	735.58	633.66	101.92					735.59
TOT		39											
AVG		2	24.15	16.90	6.90	735.54	633.55	101.99					735.58
MAX			25.80	17.00	6.90	735.65	633.76	102.22					735.74
MIN			23.90	16.80	6.90	735.35	633.34	101.81					735.50

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM					
								Friday	August	2,	2013		
	GROSS	STA	-----	OUTFLOW	-----	EL AT POWERHOUSE		AVG	SUPR	UNIT	STATUS	LWSI	
	GEN	USE	--	IN KCFS	--	IN FEET + MSL		HEAD	CAP	ON	ON		GAGE
MW	MW	TOTAL	POWER	SPILL	FOREBAY	TAILWATR	FT	MW	RMT	LINE	AVL	ELEV	
1		2	24.20	17.00	6.90	735.59	633.64	101.95				735.61	
2		2	24.20	17.00	6.90	735.62	633.79	101.83				735.55	
3		2	24.20	17.00	6.90	735.57	633.71	101.86				735.60	
4		2	24.20	17.00	6.90	735.56	633.74	101.82				735.67	
5		2	24.20	17.00	6.90	735.64	633.81	101.83				735.62	
6		2	24.30	17.10	6.90	735.65	633.68	101.97				735.64	
7		2	24.10	17.00	6.90	735.65	633.68	101.97				735.71	
8		2	24.20	17.00	6.90	735.71	633.86	101.85				735.72	
9		2	24.20	17.00	6.90	735.74	633.69	102.05				735.72	
10		2	24.20	17.00	6.90	735.74	633.75	101.99				735.77	
11		2	24.30	17.10	6.90	735.75	633.76	101.99				735.81	
12		2	24.30	17.10	6.90	735.76	633.64	102.12				735.83	
13		2	24.20	17.00	6.90	735.76	633.65	102.11				735.84	
14		2	24.30	17.10	6.90	735.78	633.75	102.03				735.83	
15		2	24.30	17.10	6.90	735.78	633.56	102.22				735.82	
16		2	24.20	17.00	6.90	735.78	633.51	102.27				735.81	
17		2	24.30	17.10	6.90	735.76	633.70	102.06				735.79	
18		2	24.30	17.20	6.90	735.76	633.59	102.17				735.80	
19		2	24.20	17.00	6.90	735.76	633.56	102.20				735.77	
20		2	24.20	17.00	6.90	735.74	633.59	102.15				735.76	
21		2	24.20	17.10	6.90	735.74	633.51	102.23				735.75	
22		2	24.20	17.00	6.90	735.73	633.46	102.27				735.75	
23		2	24.20	17.00	6.90	735.72	633.39	102.33				735.73	
24		2	24.30	17.10	6.90	735.72	633.31	102.41				735.72	
TOT		39											
AVG		2	24.23	17.04	6.90	735.71	633.64	102.07				735.73	
MAX			24.30	17.20	6.90	735.78	633.86	102.41				735.84	
MIN			24.10	17.00	6.90	735.56	633.31	101.82				735.55	

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Saturday August 3, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	24.20	17.00	6.90	735.71	633.34	102.37				735.70
2		2	24.10	16.90	6.90	735.71	633.36	102.35				735.70
3		2	24.10	16.90	6.90	735.71	633.29	102.42				735.71
4		2	24.00	16.90	6.90	735.70	633.31	102.39				735.70
5		2	24.10	16.90	6.90	735.70	633.20	102.50				735.69
6		2	24.00	16.80	6.90	735.70	633.16	102.54				735.70
7		2	24.00	16.90	6.90	735.69	633.15	102.54				735.71
8		2	24.00	16.80	6.90	735.71	632.97	102.74				735.72
9		2	24.20	17.00	6.90	735.72	633.07	102.65				735.74
10		2	24.20	17.00	6.90	735.74	633.00	102.74				735.75
11		2	25.70	16.90	8.50	735.74	632.84	102.90				735.76
12		2	27.30	17.00	10.00	735.73	632.95	102.78				735.74
13		2	27.30	17.00	10.10	735.71	632.93	102.78				735.70
14		2	27.50	17.00	10.30	735.65	633.02	102.63				735.69
15		2	27.40	17.00	10.10	735.63	633.04	102.59				735.67
16		2	27.60	17.00	10.30	735.61	633.07	102.54				735.63
17		2	27.70	17.10	10.30	735.57	633.12	102.45				735.60
18		2	27.50	17.00	10.30	735.54	633.15	102.39				735.58
19		2	27.60	17.00	10.20	735.52	633.16	102.36				735.52
20		2	27.50	17.00	10.20	735.49	633.29	102.20				735.51
21		2	27.60	17.10	10.20	735.46	633.30	102.16				735.51
22		2	27.50	17.10	10.20	735.43	633.24	102.19				735.50
23		2	27.40	17.00	10.00	735.39	633.40	101.99				735.50
24		2	27.30	17.10	10.00	735.35	633.29	102.06				735.50
TOT		39										
AVG		2	25.99	16.98	8.74	735.62	633.15	102.47				735.65
MAX			27.70	17.10	10.30	735.74	633.40	102.90				735.76
MIN			24.00	16.80	6.90	735.35	632.84	101.99				735.50

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM Sunday August 4, 2013							
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	27.30	17.10	10.00	735.35	633.26	102.09				735.50
2		2	26.70	17.00	9.40	735.35	633.40	101.95				735.49
3		2	24.20	17.00	6.90	735.35	633.35	102.00				735.50
4		2	24.10	17.00	6.90	735.34	633.40	101.94				735.50
5		2	24.10	17.00	6.90	735.35	633.37	101.98				735.49
6		2	24.10	16.90	6.90	735.37	633.43	101.94				735.50
7		2	24.10	17.00	6.90	735.37	633.50	101.87				735.50
8		2	24.10	17.00	6.90	735.38	633.43	101.95				735.50
9		2	24.10	17.00	6.90	735.42	633.42	102.00				735.50
10		2	24.10	16.90	6.90	735.42	633.50	101.92				735.49
11		2	24.10	16.90	6.90	735.46	633.43	102.03				735.50
12		2	24.20	17.00	6.90	735.50	633.49	102.01				735.49
13		2	24.30	17.10	6.90	735.52	633.55	101.97				735.50
14		2	24.30	17.10	6.90	735.54	633.50	102.04				735.52
15		2	24.20	17.10	6.90	735.56	633.53	102.03				735.55
16		2	24.30	17.10	6.90	735.56	633.54	102.02				735.56
17		2	24.30	17.10	6.90	735.56	633.53	102.03				735.58
18		2	24.20	17.00	6.90	735.56	633.50	102.06				735.58
19		2	24.30	17.10	6.90	735.57	633.53	102.04				735.58
20		2	24.20	17.10	6.90	735.57	633.43	102.14				735.60
21		2	24.20	17.10	6.90	735.57	633.58	101.99				735.59
22		2	24.20	17.10	6.90	735.57	633.59	101.98				735.59
23		2	26.00	17.10	6.90	735.50	633.37	102.13				735.59
24		2	24.20	17.10	6.90	735.59	633.56	102.03				735.58
TOT		39										
AVG		2	24.50	17.04	7.13	735.47	633.47	102.01				735.53
MAX			27.30	17.10	10.00	735.59	633.59	102.14				735.60
MIN			24.10	16.90	6.90	735.34	633.26	101.87				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Monday August 5, 2013				LWSI GAGE ELEV
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	
1		2	24.20	17.10	6.90	735.57	633.61	101.96				735.53
2		2	24.20	17.00	6.90	735.56	633.54	102.02				735.56
3		2	24.10	16.90	6.90	735.56	633.64	101.92				735.57
4		2	24.10	16.90	6.90	735.57	633.67	101.90				735.53
5		2	24.10	17.00	6.90	735.56	633.63	101.93				735.54
6		2	24.20	17.00	6.90	735.56	633.60	101.96				735.55
7		2	24.20	17.00	6.90	735.56	633.64	101.92				735.52
8		2	24.10	17.00	6.90	735.56	633.63	101.93				735.52
9		2	24.20	17.00	6.90	735.56	633.64	101.92				735.52
10		2	24.30	17.10	6.90	735.54	633.68	101.86				735.52
11		2	24.40	17.20	6.90	735.52	633.57	101.95				735.51
12		2	24.30	17.20	6.90	735.52	633.66	101.86				735.51
13		2	26.00	17.10	6.90	735.51	633.71	101.80				735.51
14		2	24.30	17.10	6.90	735.50	633.65	101.85				735.52
15		2	24.20	17.00	6.90	735.48	633.68	101.80				735.52
16		2	24.30	17.20	6.90	735.49	633.60	101.89				735.50
17		2	23.40	16.20	6.90	735.54	633.33	102.21				735.51
18		2	23.20	5.00	17.90	735.48	633.54	101.94				735.50
19		2	23.80	5.00	18.50	735.47	633.39	102.08				735.53
20		2	23.80	5.00	18.50	735.49	633.16	102.33				735.51
21		2	23.90	5.00	18.60	735.47	633.43	102.04				735.50
22		2	23.80	5.00	18.50	735.47	633.30	102.17				735.53
23		2	23.60	5.00	18.30	735.49	633.14	102.35				735.51
24		2	25.40	5.00	18.40	735.43	633.24	102.19				735.51
TOT		40										
AVG		2	24.17	13.50	10.25	735.52	633.53	101.99				735.52
MAX			26.00	17.20	18.60	735.57	633.71	102.35				735.57
MIN			23.20	5.00	6.90	735.43	633.14	101.80				735.50

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG		LOWER GRANITE DAM Tuesday August 6, 2013					
	GROSS GEN MW	STA USE MW	-----		OUTFLOW -- IN KCFS -- POWER	-----		EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT STATUS		LWSI GAGE ELEV
			TOTAL	SPILL		ON RMT	ON LINE				AVL		
1	2	23.20	4.40	18.40	735.46	633.07	102.39					735.51	
2	2	23.60	5.00	18.30	735.49	633.00	102.49					735.51	
3	2	23.60	5.00	18.30	735.51	633.05	102.46					735.50	
4	2	23.80	5.00	18.50	735.50	632.85	102.65					735.50	
5	2	23.60	6.00	17.30	735.51	632.82	102.69					735.50	
6	2	24.10	17.00	6.90	735.52	633.07	102.45					735.50	
7	2	24.20	17.00	6.90	735.50	632.89	102.61					735.50	
8	2	24.20	17.00	6.90	735.50	633.07	102.43					735.50	
9	2	24.30	17.10	6.90	735.49	633.05	102.44					735.50	
10	2	24.20	17.00	6.90	735.49	632.92	102.57					735.50	
11	2	24.20	17.00	6.90	735.50	633.08	102.42					735.53	
12	2	24.20	17.10	6.90	735.56	633.09	102.47					735.53	
13	2	24.20	17.00	6.90	735.56	633.02	102.54					735.53	
14	2	24.20	17.00	6.90	735.56	633.12	102.44					735.58	
15	2	25.90	17.00	6.90	735.58	633.15	102.43					735.57	
16	2	24.20	17.00	6.90	735.59	633.09	102.50					735.56	
17	2	23.20	15.60	7.30	735.61	632.95	102.66					735.56	
18	2	17.30	0.00	17.00	735.59	632.95	102.64					735.58	
19	2	22.30	5.00	17.00	735.60	632.70	102.90					735.63	
20	2	25.50	5.00	20.20	735.59	632.89	102.70					735.64	
21	2	25.50	5.00	20.20	735.59	633.05	102.54					735.59	
22	2	25.60	5.00	20.30	735.56	632.95	102.61					735.60	
23	2	25.50	5.00	20.20	735.56	633.03	102.53					735.60	
24	2	25.50	5.00	20.20	735.60	633.03	102.57					735.55	
TOT	40												
AVG	2	24.00	10.76	12.88	735.54	633.00	102.55					735.54	
MAX		25.90	17.10	20.30	735.61	633.15	102.90					735.64	
MIN		17.30	0.00	6.90	735.46	632.70	102.39					735.50	

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NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT						PROJECT- LWG LOWER GRANITE DAM	Wednesday August 7, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	25.40	5.00	20.10	735.53	633.09	102.44				735.55
2		2	25.70	5.00	20.40	735.52	633.07	102.45				735.53
3		2	25.60	5.00	20.30	735.51	633.07	102.44				735.52
4		2	25.60	5.00	20.30	735.49	633.14	102.35				735.52
5		2	25.30	6.00	19.00	735.46	632.98	102.48				735.51
6		2	24.10	17.00	6.90	735.49	633.27	102.22				735.51
7		2	24.20	17.10	6.90	735.46	633.33	102.13				735.50
8		2	24.30	17.20	6.90	735.45	633.22	102.23				735.50
9		2	24.30	17.10	6.90	735.46	633.29	102.17				735.50
10		2	24.30	17.10	6.90	735.45	633.32	102.13				735.51
11		2	24.30	17.10	6.90	735.43	633.30	102.13				735.50
12		2	24.20	17.10	6.90	735.44	633.46	101.98				735.50
13		2	24.30	17.20	6.90	735.45	633.33	102.12				735.50
14		2	26.00	17.10	6.90	735.43	633.30	102.13				735.50
15		2	24.30	17.10	6.90	735.45	633.41	102.04				735.50
16		2	24.20	17.10	6.90	735.43	633.37	102.06				735.50
17		2	25.40	15.60	7.80	735.43	633.24	102.19				735.49
18		2	23.60	5.00	18.30	735.45	633.27	102.18				735.49
19		2	23.60	5.00	18.30	735.46	633.31	102.15				735.50
20		2	23.60	5.00	18.30	735.43	633.23	102.20				735.50
21		2	23.50	5.00	18.20	735.43	633.23	102.20				735.50
22		2	23.50	5.00	18.20	735.45	633.33	102.12				735.49
23		2	23.50	5.00	18.20	735.43	633.22	102.21				735.50
24		2	23.30	5.00	18.00	735.43	633.21	102.22				735.50
TOT		40										
AVG		2	24.42	11.03	12.97	735.46	633.25	102.21				735.50
MAX			26.00	17.20	20.40	735.53	633.46	102.48				735.55
MIN			23.30	5.00	6.90	735.43	632.98	101.98				735.49

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LWG LOWER GRANITE DAM		Thursday August 8, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
	1	2	25.10	5.00	18.10	735.43	633.34	102.09				735.50
	2	2	23.40	5.00	18.10	735.43	633.26	102.17				735.50
	3	2	23.40	5.00	18.10	735.40	633.17	102.23				735.49
	4	2	23.40	5.00	18.10	735.43	633.20	102.23				735.50
	5	2	23.50	5.00	18.20	735.33	633.19	102.14				735.49
	6	2	24.40	17.00	7.10	735.40	633.29	102.11				735.50
	7	2	24.20	17.00	6.90	735.46	633.25	102.21				735.50
	8	2	24.10	17.00	6.90	735.48	633.35	102.13				735.49
	9	2	24.00	16.90	6.90	735.50	633.34	102.16				735.50
	10	2	24.10	17.00	6.90	735.51	633.32	102.19				735.50
	11	2	24.10	16.90	6.90	735.51	633.37	102.14				735.49
	12	2	24.10	16.90	6.90	735.51	633.44	102.07				735.49
	13	2	24.10	16.90	6.90	735.46	633.21	102.25				735.52
	14	2	24.10	16.90	6.90	735.50	633.40	102.10				735.50
	15	2	24.10	16.90	6.90	735.47	633.42	102.05				735.50
	16	2	25.80	16.90	6.90	735.47	633.35	102.12				735.50
	17	2	23.50	15.80	7.40	735.53	633.20	102.33				735.50
	18	2	24.10	4.70	19.10	735.47	633.39	102.08				735.50
	19	2	24.50	5.00	19.20	735.46	633.34	102.12				735.50
	20	2	24.50	5.00	19.20	735.47	633.17	102.30				735.50
	21	2	24.50	5.00	19.20	735.43	633.46	101.97				735.50
	22	2	24.40	5.00	19.10	735.40	633.41	101.99				735.50
	23	2	24.20	5.00	18.90	735.39	633.30	102.09				735.50
	24	2	24.20	5.00	18.90	735.41	633.49	101.92				735.50
TOT		39										
AVG		2	24.16	10.91	12.82	735.45	633.32	102.13				735.50
MAX			25.80	17.00	19.20	735.53	633.49	102.33				735.52
MIN			23.40	4.70	6.90	735.33	633.17	101.92				735.49

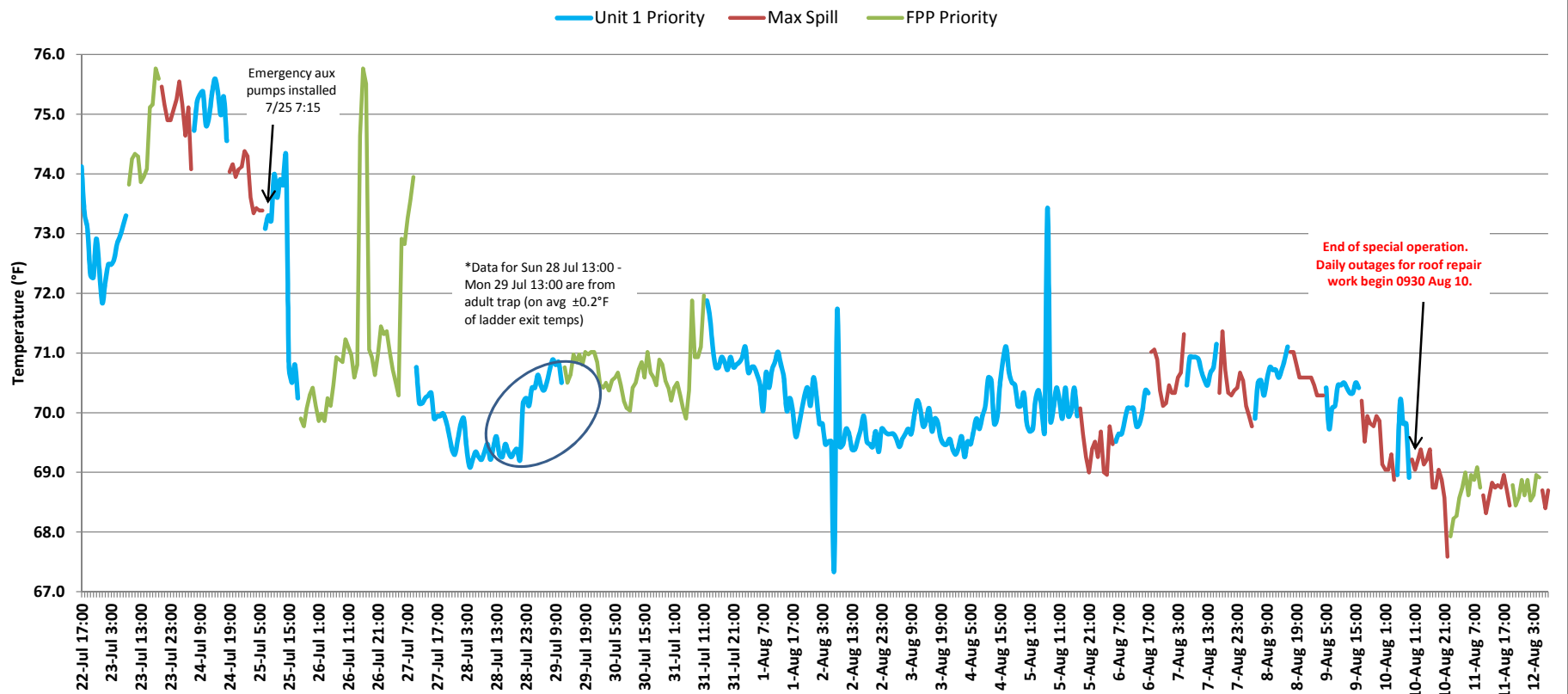
1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM		Friday August 9, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	24.30	5.00	19.00	735.39	633.44	101.95					735.51
2		2	24.30	5.00	19.00	735.35	633.24	102.11					735.51
3		2	24.30	5.00	19.00	735.38	633.46	101.92					735.50
4		2	24.40	5.00	19.10	735.35	633.31	102.04					735.49
5		2	24.00	5.40	18.30	735.35	633.09	102.26					735.50
6		2	24.20	17.00	6.90	735.35	633.51	101.84					735.50
7		2	25.90	17.10	6.90	735.32	633.36	101.96					735.50
8		2	24.20	17.00	6.90	735.35	633.42	101.93					735.50
9		2	24.20	17.00	6.90	735.33	633.57	101.76					735.49
10		2	24.20	17.00	6.90	735.32	633.53	101.79					735.49
11		2	24.10	17.00	6.90	735.29	633.52	101.77					735.50
12		2	24.30	17.20	6.90	735.28	633.56	101.72					735.50
13		2	24.20	17.10	6.90	735.26	633.51	101.75					735.49
14		2	24.10	16.90	6.90	735.26	633.53	101.73					735.50
15		2	24.10	17.00	6.90	735.25	633.62	101.63					735.49
16		2	24.10	17.00	6.90	735.24	633.50	101.74					735.49
17		2	24.20	17.10	6.90	735.24	633.57	101.67					735.49
18		2	22.30	5.70	16.30	735.24	633.37	101.87					735.49
19		2	23.80	5.00	18.50	735.24	633.31	101.93					735.50
20		2	25.50	5.00	18.50	735.24	633.36	101.88					735.49
21		2	23.80	5.00	18.50	735.24	633.36	101.88					735.49
22		2	23.70	5.00	18.40	735.15	633.36	101.79					735.49
23		2	23.50	5.00	18.20	735.21	633.30	101.91					735.49
24		2	23.60	5.00	18.30	735.21	633.40	101.81					735.49
TOT		39											
AVG		2	24.14	11.06	12.66	735.28	633.42	101.86					735.50
MAX			25.90	17.20	19.10	735.39	633.62	102.26					735.51
MIN			22.30	5.00	6.90	735.15	633.09	101.63					735.49

1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM		Saturday August 10, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	23.60	5.00	18.30	735.18	633.39	101.79					735.49
2		2	23.60	5.00	18.30	735.19	633.42	101.77					735.49
3		2	23.70	5.00	18.40	735.19	633.31	101.88					735.48
4		2	23.70	5.00	18.40	735.19	633.46	101.73					735.49
5		2	23.10	5.60	17.20	735.22	633.29	101.93					735.48
6		2	24.10	16.90	6.90	735.21	633.48	101.73					735.49
7		2	24.10	17.00	6.80	735.19	633.56	101.63					735.49
8		2	24.30	17.10	6.80	735.22	633.54	101.68					735.49
9		2	23.30	15.90	7.10	735.24	633.41	101.83					735.48
10		2	23.70	5.00	18.40	735.18	633.44	101.74					735.48
11		2	25.50	5.00	18.50	735.22	633.49	101.73					735.48
12		2	23.80	5.00	18.50	735.23	633.33	101.90					735.48
13		2	23.90	5.00	18.60	735.23	633.52	101.71					735.48
14		2	23.90	5.00	18.60	735.23	633.60	101.63					735.48
15		2	23.90	5.00	18.60	735.26	633.43	101.83					735.47
16		2	25.60	5.00	18.60	735.24	633.57	101.67					735.47
17		2	23.90	5.00	18.60	735.19	633.45	101.74					735.48
18		2	23.90	5.00	18.60	735.18	633.40	101.78					735.48
19		2	23.90	5.00	18.60	735.20	633.51	101.69					735.48
20		2	23.90	5.00	18.60	735.20	633.48	101.72					735.48
21		2	23.80	5.00	18.50	735.15	633.47	101.68					735.47
22		2	23.70	5.00	18.40	735.16	633.53	101.63					735.48
23		2	22.30	10.20	11.80	735.25	633.52	101.73					735.47
24		2	21.90	11.70	9.90	735.23	633.58	101.65					735.47
TOT		39											
AVG		2	23.80	7.47	15.88	735.21	633.47	101.74					735.48
MAX			25.60	17.10	18.60	735.26	633.60	101.93					735.49
MIN			21.90	5.00	6.80	735.15	633.29	101.63					735.47

1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM		Sunday August 11, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	22.00	11.70	10.00	735.22	633.57	101.65					735.47
2		2	22.00	11.70	10.00	735.25	633.57	101.68					735.47
3		2	22.00	11.70	10.00	735.28	633.64	101.64					735.46
4		2	22.00	11.60	10.10	735.26	633.61	101.65					735.48
5		2	22.10	11.70	10.10	735.28	633.42	101.86					735.47
6		2	22.00	11.60	10.10	735.32	633.46	101.86					735.47
7		2	22.10	11.70	10.10	735.32	633.47	101.85					735.46
8		2	22.10	11.70	10.10	735.33	633.36	101.97					735.46
9		2	22.00	11.60	10.10	735.35	633.54	101.81					735.46
10		2	20.20	4.70	15.20	735.36	633.07	102.29					735.46
11		2	20.60	5.00	15.30	735.39	632.92	102.47					735.47
12		2	20.60	5.00	15.30	735.39	633.04	102.35					735.47
13		2	22.30	5.00	15.30	735.39	633.13	102.26					735.46
14		2	20.70	5.00	15.40	735.46	633.07	102.39					735.46
15		2	20.70	5.00	15.40	735.43	633.10	102.33					735.46
16		2	22.40	5.00	15.40	735.43	633.16	102.27					735.55
17		2	20.70	5.00	15.40	735.48	633.07	102.41					735.51
18		2	20.70	5.00	15.40	735.51	633.11	102.40					735.51
19		2	20.70	5.00	15.40	735.43	633.16	102.27					735.56
20		2	22.10	8.50	13.30	735.64	633.34	102.30					735.52
21		2	21.90	11.60	10.00	735.52	633.92	101.60					735.50
22		2	21.80	11.50	10.00	735.53	633.63	101.90					735.55
23		2	21.90	11.60	10.00	735.55	633.70	101.85					735.56
24		2	23.60	11.60	10.00	735.53	633.83	101.70					735.55
TOT		38											
AVG		2	21.63	8.73	12.39	735.40	633.37	102.03					735.49
MAX			23.60	11.70	15.40	735.64	633.92	102.47					735.56
MIN			20.20	4.70	10.00	735.22	632.92	101.60					735.46

1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LWG LOWER GRANITE DAM		Monday August 12, 2013					
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL	LWSI GAGE ELEV
1		2	22.00	11.70	10.00	735.52	633.58	101.94					735.59
2		2	22.00	11.70	10.00	735.57	633.64	101.93					735.59
3		2	22.00	11.60	10.10	735.57	633.75	101.82					735.59
4		2	22.10	11.70	10.20	735.56	633.70	101.86					735.60
5		2	22.10	11.60	10.20	735.58	633.71	101.87					735.60
6		2	21.80	10.90	10.60	735.55	633.54	102.01					735.62
7		2	20.60	5.00	15.30	735.59	633.19	102.40					735.63
8		2	20.50	5.00	15.20	735.61	633.20	102.41					735.62
9		2	22.20	5.00	15.20	735.64	633.43	102.21					735.66
10		2	22.20	5.00	15.20	735.57	633.16	102.41					735.66
11		2	20.40	5.00	15.10	735.61	633.16	102.45					735.64
12		2	22.10	5.00	15.10	735.62	633.48	102.14					735.67
13		2	20.50	5.00	15.20	735.63	633.07	102.56					735.71
14		2	20.90	5.00	15.60	735.66	633.23	102.43					735.68
15		2	23.60	5.00	18.30	735.62	633.68	101.94					735.73
16		2	23.60	5.00	18.30	735.64	633.57	102.07					735.71
17		2	23.60	5.00	18.30	735.64	633.60	102.04					735.68
18		2	25.30	5.00	18.30	735.64	633.62	102.02					735.67
19		2	23.60	5.00	18.30	735.62	633.54	102.08					735.69
20		2	21.50	5.00	16.20	735.68	633.59	102.09					735.66
21		2	21.10	5.00	15.80	735.66	633.44	102.22					735.67
22		2	21.10	5.00	15.80	735.67	633.37	102.30					735.69
23		2	21.00	5.00	15.70	735.69	633.58	102.11					735.70
24		2	20.90	5.00	15.60	735.72	633.28	102.44					735.71
TOT		39											
AVG		2	21.95	6.63	14.73	735.62	633.46	102.16					735.66
MAX			25.30	11.70	18.30	735.72	633.75	102.56					735.73
MIN			20.40	5.00	10.00	735.52	633.07	101.82					735.59

LWG Adult Ladder Exit Temp (°F), 22 JULY 17:00 - 12 AUG 08:00



COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

August 14, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert; Facilitation Support: Emily Plummer

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Treaty Fishing

Kyle Dittmer, CRITFC, informed the group that the first tribal fall fishery is planned to start August 19th and continue to August 21st; an SOR will be submitted to Corps within the next day or two. This item will be added to the 8/21 TMT agenda.

Lower Granite Dam Operations for Adult Ladder Temperature Issues

Doug Baus, Corps, provided a recap on the Lower Granite Adult Ladder Temperature operation that ended August 10th. The operation implemented a Unit 1 priority during daylight hours and station service and spill to the gas cap at night. Hourly temperature and passage data were posted daily during the operation and continued to be provided through August 12th. Doug reported that adult Sockeye were able to pass, although numbers were low.

Additionally, auxiliary pumps have been utilized at Lower Granite to pump cool water into the fishway which has helped to lower water temperatures; however, use of the pumps prevents use of the adult trap. Doug Baus suggested that Corps would like to see the adult trap reopen within the next two weeks and FPAC input would be appreciated.

Action/Next Steps: Russ Kiefer, Idaho Fish and Game, will discuss reopening the adult trap and turning off the auxiliary pumps with project researchers and operators and develop a proposal to discuss with FPAC during their weekly call next Tuesday, 8/20. TMT will discuss FPAC's proposal at the August 21st TMT meeting.

Lower Monumental Juvenile Transport

Paul Wagner, NOAA, reported that high levels of Columnaris have been detected in the juveniles sampled at Lower Monumental; Columnaris is common in juveniles at this time of year due to warm water temperatures. He explained that past operations have implemented every day trucking to get the fish past Bonneville quickly, however, due to low fish counts the salmon managers suggest this year to keep fish in the river and allow for full bypass with condition sampling every third day. The action agencies agreed with the proposed plan, and Doug said this operation would commence today at 3:00 pm and is expected to continue for the next two weeks, unless there is a significant increase in collection numbers.

Ken Fone, Corps Walla Walla, reported that the conditions appear to be improving; yesterday's sample revealed no signs of Columnaris and there were no mortalities. Ken also inquired as to if they should hold the secondary bypass open for longer than normal in order to divert a large enough sample size for the condition sampling. Paul Wagner agreed that the secondary bypass could be open for a longer duration and that he would defer the decision to the project; Russ Kiefer, Idaho, requested that the Fish Passage Center be a part of conversations regarding the sample duration.

Dworshak Temperature Operation

Steve Hall, Corps, reported that according to the latest models, the average discharge from Dworshak is expected to be 8 kcfs from now through the end of August in order to reach the targeted 1535 foot elevation. As such, and given cooling conditions, the project backed off from full powerhouse to 8 kcfs on 8/13. As of the time of the conference call, the Lower Granite Dam tailwater temperature was 66°F; if temperatures approach 68°F the Dworshak operation will increase back to full powerhouse, however, this may cause less flow available towards the end of August. There have been some inconsistencies with the model due to the recent special operations at Lower Granite, however, they are monitoring conditions closely and will adjust the operation if needed to keep temperatures below 68 °F. It was noted that the operation has gone very well this year.

Spill Priority List

The winter 2013 Spill Priority List (SPL) was provided to TMT for review. The current SPL terminates at the end of August and the Winter SPL extends from September 1 through the end of December. The list is the same as last year's, starting at Bonneville and moving sequentially upstream to Lower Granite.

Action/Next Steps: Paul Wagner will take the SPL to FPAC for discussion and will provide feedback at the next TMT meeting.

Next Face to Face Meeting, August 21st at 9:00-12:00

Agenda

- Treaty Fishery Update
- Lower Granite Adult Trap Re-opening Trigger
- Dworshak Temperature Operation
- Spill Priority List
- Libby Operation

Columbia River Regional Forum

TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

August 14, 2013

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, Idaho, BPA, BOR, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Treaty Fishing

The tribes agreed yesterday to start autumn treaty fishing season next week, Kyle Dittmer, CRITFC, reported. Days of operation will be from Monday, August 19, through Wednesday, August 21. The SOR requesting this operation will be ready for the COE soon. TMT will revisit this operation at its next meeting on August 21.

3. Update: Lower Granite Dam Operations for Adult Ladder Temperature Issues

The operation coordinated during the August 5 TMT meeting to increase adult sockeye passage at Lower Granite Dam ended on August 10. The operation involved operating unit 1 as the priority unit during the day (0500 to 1700 hours) and operating one unit at station service (5 kcfs) and spill not to exceed the gas cap at night (1700 to 0500 hours). Part of this operation included operating 2 auxiliary pumps in the fish ladder that were effective at their purpose of cooling the ladder but unfortunately rendered the adult fish trap inoperable. Baus asked the region to consider a date to discontinue operation of the auxiliary fish pumps because the Corps would like to resume operation of the adult fish trap soon. The best approach, said Russ Kiefer, Idaho, would be to have the region work together at the technical level to identify a forebay trigger temperature that would allow Lower Granite to resume normal operations.

Paul Wagner, NOAA, suggested that FPAC discuss the situation on August 19 and provide feedback to TMT at its next meeting August 21. Kiefer, who initiated the effort to address adult sockeye passage conditions at Lower Granite, said August 21 should be soon enough. TMT will revisit Lower Granite operations then.

4. Lower Monumental Juvenile Transportation

This time of year, it's typical to observe a spike in columnaris in the juvenile condition sampling at Lower Monumental, Wagner reported. In the past few years, juvenile salmon have been trucked below the dam, which is beneficial to some degree because it gets the juveniles past predators quickly. However, the risks involved in

combining healthy fish with possibly diseased fish make transport a less satisfying option than in-river passage.

Given the fact that juvenile numbers are currently low, FPAC's consensus this year is to return the trapped fish to the project at full-flow bypass and sample every third day to monitor conditions, Wagner reported. Yesterday the collection count went up to nearly 100 fish; two days ago only 3 fish were collected. With these numbers, FPAC's recommended strategy should be sufficient over the next two weeks unless juvenile passage increases dramatically at upstream projects. If that occurs, it might be time to change the strategy.

The COE will implement FPAC's consensus and make the change at 3 pm today, Baus said. Juveniles will be bypassed at Lower Monumental and condition sampling will take place every three days.

Ken Fone, COE Walla Walla, reported that project staff are flexible in terms of whether fish are bypassed or trucked, and columnaris has not been collected in the past 3 days' samples. Yesterday, of 54 fish collected the mortality rate was zero. The small numbers of fish passing mean that fewer than 10 fish would be sampled every 3 days. Fone asked the Salmon Managers, is that adequate condition sampling? Wagner suggested a longer duration for the sample. Kiefer recommended including Fish Passage Center representation in decision-making regarding the duration of the sampling effort; Fone will follow up on that.

There was agreement that a TMT conference call on August 28 to address juvenile transport is not needed unless something unexpected arises. TMT will revisit this issue at its September 4 meeting.

5. Dworshak Temperature Operation

Steve Hall, COE Walla Walla, reported on Dworshak operations. Currently, discharges are a little less than 8 kcfs to meet the objective of elevation 1535 feet at Dworshak reservoir by end August. The COE has been modeling temperature conditions daily and decided yesterday to reduce flows to 8 kcfs.

On August 6, the model indicated it was time to back off releases, given the constraints at Dworshak and the fact that Lower Granite tailwater temperatures are hovering between 65-66 degrees F. Model results to date don't suggest that the Lower Granite tailwater will exceed the 68 degrees F standard in the near term, despite the fact that in a few days slightly reduced flows from Dworshak will arrive.

Kiefer asked, is it reasonable to believe that increased temperatures could cause an exceedance of the 68 degrees F standard? Hall said yes, it could be close. The model is having difficulty caused by the special operation that occurred at Lower Granite Dam.

Given that temperatures will be hot and dry over the next two weeks, Kiefer said this needs to be watched closely. TMT will revisit the Dworshak temperature operation at its next meeting August 21.

6. Spill Priority List

The winter spill priority list attached to this item on today's agenda, with Bonneville as top priority and Lower Granite as last priority, is consistent with the September to December 2012 spill priority list, Baus said.

FPAC has not yet discussed this list in light of current conditions, Wagner replied. Discussion of the winter spill priority list was postponed until the next TMT meeting.

7. Next Meeting

TMT will meet next in person on August 21 and again on September 4. There could be a conference call on August 28 if in-river passage conditions for juveniles at Lower Granite warrant TMTs attention.

Name	Affiliation
Paul Wagner	NOAA
Russ Kiefer	Idaho
Doug Baus	COE
Agnes Lut	BPA
John Roache	BOR
Kyle Dittmer	CRITFC
Ken Fone	COE Walla Walla
Steve Hall	COE Walla Walla
Heather Dohan	Puget
Laura Hamilton	COE
Lisa Wright	COE
Greg Lawson	Thompson Reuters
Richelle Beck	Grant PUD
Russ George	WMC
Emily Plummer	DS Consulting
Barry Espenson	CBB
Dave Benner	FPC

SPILL PRIORITY LIST - Effective September 1 through December 31, 2013.

LEVEL 1 – up to the 110% TDG STANDARD¹		
PRIORITY ORDER	PROJECT	SPILL ESTIMATE (KCFS)
01	BON	70
02	TDA	45
03	JDA	20
04	MCN	48
05	IHR	25
06	LMN	18
07	LGS	18
08	LWG	20
09	DWR	35% of total flow
10	CHJ	25
11	GCL	0 (OT) or 5 (DG) ²

LEVEL 2 – up to 115% TDG		
PRIORITY ORDER	PROJECT	SPILL ESTIMATE (KCFS)
12	BON	100
13	TDA	60
14	JDA	80
15	MCN	80
16	IHR	35
17	LMN	23
18	LGS	23
19	LWG	30
20	CHJ	61
21	GCL	5 (OT) or 10 (DG) ²

LEVEL 3 – up to 120% TDG		
PRIORITY ORDER	PROJECT	SPILL ESTIMATE (KCFS)
22	BON	140
23	TDA	135
24	JDA	144
25	MCN	140
26	IHR	75
27	LMN	44
28	LGS	52
29	LWG	45
30	CHJ	150
31	GCL	10 (OT) or 15 (DG)

LEVELS 4-7 (125%, 127%, 130%, and 135% TDG, respectively): Same project Priority Order as in Level 3.

¹ Outside of Fish Passage Season, the Clean Water Act standard for total dissolved gas (TDG) is ≤110% at all projects.

² Spill at GCL is either through the outlet tubes (OT) or the drum gates (DG), depending on reservoir elevation. Spill through the OT produces more TDG.



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

700 NE Multnomah Street, Suite 1200
Portland, Oregon 97232

(503) 238-0667
F (503) 235-4228
www.critfc.org

SYSTEM OPERATIONAL REQUEST: 2013 C-6

TO: Col. John S. Kem COE-NWD
James D. Barton COE-NWD-NP-Water Management
K. Kanbergs, S. Burrell, D. Baus COE-NWD-NP-WM-RCC
D. Feil, R. Peters, D. Ponganis COE-NWD-PDD (Fish Management Office)
JR Inglis/Paul Cloutier COE-Portland District/NWD (Tribal Liaison)
Lorri Lee USBR- PNW Regional Director
Elliot Mainzer Acting BPA Administrator
Steve Oliver, Greg Delwiche BPA-PG-5
Scott Bettin, Tony Norris BPA-Operations Planning-PGPO
Stan Speaks, Keith Hatch BIA, Northwest Regional Office

FROM: B. Paul Lumley, *Executive Director*

DATE: August 14, 2013

SUBJECT: **Operation of the Lower Columbia Pools for the Autumn 2013 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the autumn 2013 Treaty fishery. This effort supports the 2013 ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

Monday, August 19, 2013, 6 am, through Wednesday, August 21, 2013, 6 pm.

Monday, August 26, 2013, 6 am, through Friday, August 30, 2013, 6 pm.

Tuesday, September 3, 2013, 6 am, through Saturday, September 7, 2013, 6 pm.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

At this time we anticipate additional treaty fisheries later in September. CRITFC will notify the Corps with specific times for the tribal fishery after each Compact hearing, via a new SOR.

JUSTIFICATION:

The 2013 autumn treaty fishing season is of critical importance to CRITFC's member tribes. The escapement (Columbia at Bonneville Dam) of an estimated of **460,000 (Columbia at Bonneville Dam) adult upriver fall Chinook (above average rank), 322,000 Steelhead (below average rank), and 135,000 Coho (near normal rank)** will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day.

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become lost, continuing to catch fish, and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB, Friday August 16, 2013. Thank you for considering this request. Please contact Kyle Dittmer or Stuart Ellis should you have any questions at (503) 238-0667.

cc: Tribal staffs and attorneys

TECHNICAL MANAGEMENT TEAM

NOAA: Paul Wagner / Richard Domingue

USFWS: David Wills / Steve Haeseker

OR: Erick Van Dyke

ID: Russ Kiefer / Pete Hassemer

WA: Charles Morrill

MT: Jim Litchfield / Brian Marotz

Kootenai: Sue Ireland / Billy Barquin

Spokane: Andy Miller

Colville: Sheri Sears / Keith Wolf

Nez Perce: Dave Statler

Umatilla: Tom Lorz (CRITFC)

BOR: John Roache / Mary Mellema / Pat McGrane

BPA: Tony Norris / Scott Bettin / Robyn MacKay

COE: Doug Baus / Karl Kanbergs

TMT MEETING

Wednesday August 21, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room

Portland, Oregon 97209-4142

Map Quest [\[Directions\]](#)

TMT MEETING

Phone Number (877) 336-1274

Access Code 3871669

Security Code 2196

We have had disruptions on the phone because people are not hitting 'mute' after dial in.

Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.

Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

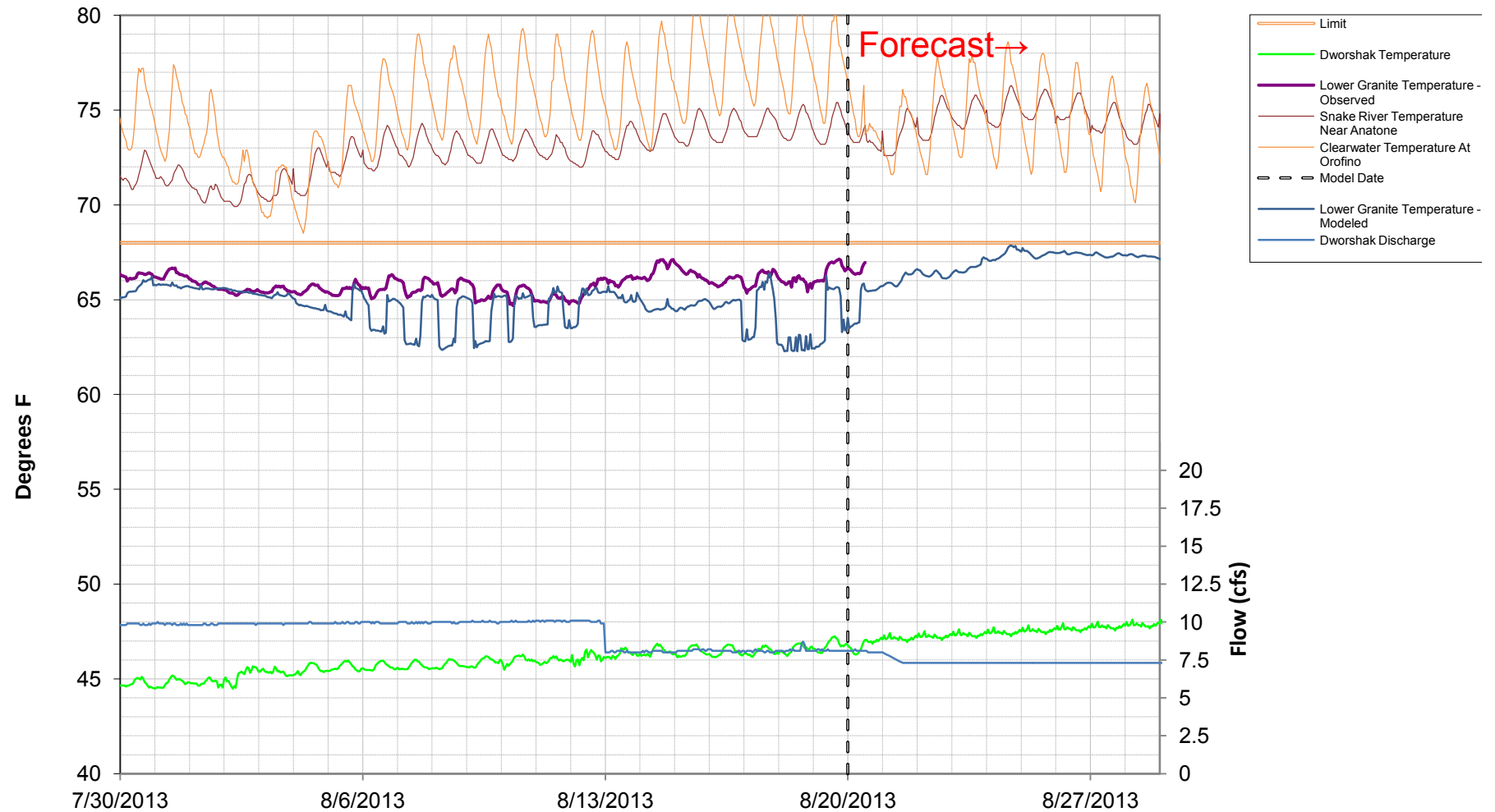
1. Welcome and Introductions
2. Review Meeting Minutes - [July 24, 26, 29, 31 and August 2, 5, and 14](#)
3. Libby Operations - Adam Price, COE-NWS
4. Lower Monumental Dam Juvenile Transportation - Doug Baus, COE-NWD; Ken Fone, COE-NWW
5. Lower Monumental Dam Low Flow Spill Pattern - Doug Baus, COE-NWD
 - a. [2006 LMN Spill Pattern w/ no RSW](#)
 - b. [LMN 8/20/13 Hourly Operations](#)
 - c. [**UPDATED** TMT Coordinated LMN Spill Pattern Effective 8/21 at 3pm](#)

6. Little Goose Dam Low Flow Spill Change - *Doug Baus, COE-NWD*
 - a. [LGS 8/20/13 Hourly Operations](#)
7. Lower Granite Dam Adult Ladder Auxiliary Pump Operation - *Doug Baus, COE-NWD*
8. Dworshak Temperature Control Operation - *Jeremy Giovando, COE-NWW*
 - a. [Water Temperature Model](#)
 - b. [Current Water Temperature](#)
9. Treaty Fishing - *Kyle Dittmer, CRITFC*
 - a. [SOR2013-C6](#)
10. Spill Priority List - *Doug Baus, COE NWD*
 - a. [Winter time](#)
11. End of MOP - *Tony Norris, BPA*
12. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
13. Other
 - a. Set agenda and date for next meeting - **September 4, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

Output from CEQUALUtility Pre-processor
Analog Year 2007

Water Temperature Comparisons Model from 7/30/2013 to 8/29/2013 Observed Data to 8/20/2013



1		NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT				PROJECT- LGS		LITTLE GOOSE DAM Tuesday August 20, 2013				
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR		AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE	AVL
1		1	22.20	14.30	7.50	634.30	537.90	96.40				
2		1	23.80	14.50	7.50	634.40	537.94	96.46				
3		1	24.70	16.80	7.50	634.35	537.90	96.45				
4		1	26.40	17.10	7.50	634.22	537.85	96.37				
5		1	24.80	16.90	7.50	634.18	537.84	96.34				
6		1	26.30	17.00	7.50	634.23	537.87	96.36				
7		1	24.80	17.00	7.50	634.18	537.84	96.34				
8		1	24.80	17.00	7.50	634.12	537.81	96.31				
9		1	25.00	17.10	7.40	634.11	537.81	96.30				
10		1	24.90	17.00	7.40	634.12	537.81	96.31				
11		1	24.40	16.60	7.40	634.07	537.80	96.27				
12		1	23.90	14.60	7.40	634.04	537.78	96.26				
13		1	19.30	12.50	6.30	634.13	537.82	96.31				
14		1	15.70	11.50	3.70	634.09	537.80	96.29				
15		1	15.60	11.40	3.70	634.07	537.80	96.27				
16		1	17.00	11.40	3.70	634.13	537.83	96.30				
17		1	15.50	11.60	3.50	634.16	537.83	96.33				
18		1	13.80	11.60	1.90	634.12	537.80	96.32				
19		1	14.80	11.50	2.80	634.16	537.83	96.33				
20		1	17.50	11.60	5.60	634.13	537.83	96.30				
21		1	17.70	11.70	5.60	634.10	537.82	96.28				
22		1	19.20	11.60	5.90	634.12	537.80	96.32				
23		1	19.40	11.60	7.50	634.21	537.84	96.37				
24		1	22.40	14.50	7.50	634.22	537.87	96.35				
TOT		16										
AVG		1	21.00	14.10	6.14	634.16	537.83	96.33				
MAX			26.40	17.10	7.50	634.40	537.94	96.46				
MIN			13.80	11.40	1.90	634.04	537.78	96.26				

Table LMN-11. Lower Monumental Dam spill pattern for gas abatement.

Spill Bay								Total Stops	Total Spill
1	2	3	4	5	6	7	8		
1								1	1.1
1							1	2	2.2
1	1						1	3	3.3
1	1					1	1	4	4.4
1	1	1				1	1	5	5.5
1	1	1			1	1	1	6	6.6
1	1	1	1		1	1	1	7	7.7
1	1	1	1	1	1	1	1	8	8.8
2	1	1	1	1	1	1	1	9	10.5
2	1	1	1	1	1	1	2	10	12.2
2	2	1	1	1	1	1	2	11	13.9
2	2	1	1	1	1	2	2	12	15.6
2	2	2	1	1	1	2	2	13	17.3
2	2	2	1	1	2	2	2	14	19.0
2	2	2	2	1	2	2	2	15	20.7
2	2	2	2	2	2	2	2	16	22.4
3	2	2	2	2	2	2	2	17	24.2
3	2	2	2	2	2	2	3	18	26.0
3	3	2	2	2	2	2	3	19	27.8
3	3	2	2	2	2	3	3	20	29.6
3	3	3	2	2	2	3	3	21	31.4
3	3	3	2	2	3	3	3	22	33.2
3	3	3	3	2	3	3	3	23	35.0
3	3	3	3	3	3	3	3	24	36.8
4	3	3	3	3	3	3	3	25	38.4
4	3	3	3	3	3	3	4	26	40.0
4	4	3	3	3	3	3	4	27	41.6
4	4	3	3	3	3	4	4	28	43.2
4	4	4	3	3	3	4	4	29	44.8
4	4	4	3	3	4	4	4	30	46.4
4	4	4	4	3	4	4	4	31	48.0
4	4	4	4	4	4	4	4	32	49.6
5	4	4	4	4	4	4	4	33	51.3
5	4	4	4	4	4	4	5	34	53.0
5	5	4	4	4	4	4	5	35	54.7
5	5	4	4	4	4	5	5	36	56.4
5	5	5	4	4	4	5	5	37	58.1
5	5	5	4	4	5	5	5	38	59.8
5	5	5	5	4	5	5	5	39	61.5

Table LMN-11. Lower Monumental Dam spill pattern for gas abatement (Continued).

Spill Bay								Total Stops	Total Spill
1	2	3	4	5	6	7	8		
5	5	5	5	5	5	5	5	40	63.2
6	5	5	5	5	5	5	5	41	64.9
6	5	5	5	5	5	5	6	42	66.6
6	6	5	5	5	5	5	6	43	68.3
6	6	5	5	5	5	6	6	44	70.0
6	6	6	5	5	5	6	6	45	71.7
6	6	6	5	5	6	6	6	46	73.4
6	6	6	6	5	6	6	6	47	75.1
6	6	6	6	6	6	6	6	48	76.8
7	6	6	6	6	6	6	6	49	78.5
7	6	6	6	6	6	6	7	50	80.2
7	7	6	6	6	6	6	7	51	81.9
7	7	6	6	6	6	7	7	52	83.6
7	7	7	6	6	6	7	7	53	85.3
7	7	7	6	6	7	7	7	54	87.0
7	7	7	7	6	7	7	7	55	88.7
7	7	7	7	7	7	7	7	56	90.4
8	7	7	7	7	7	7	7	57	92.2
8	7	7	7	7	7	7	8	58	94.0
8	8	7	7	7	7	7	8	59	95.8
8	8	7	7	7	7	8	8	60	97.6
8	8	8	7	7	7	8	8	61	99.4
8	8	8	7	7	8	8	8	62	101.2
8	8	8	8	7	8	8	8	63	103.0
8	8	8	8	8	8	8	8	64	104.8
9	8	8	8	8	8	8	8	65	106.5
9	8	8	8	8	8	8	9	66	108.2
9	9	8	8	8	8	8	9	67	109.9
9	9	8	8	8	8	9	9	68	111.6
9	9	9	8	8	8	9	9	69	113.3
9	9	9	8	8	9	9	9	70	115.0
9	9	9	9	8	9	9	9	71	116.7
9	9	9	9	9	9	9	9	72	118.4
10	9	9	9	9	9	9	9	73	120.1
10	9	9	9	9	9	9	10	74	121.8
10	10	9	9	9	9	9	10	75	123.5
10	10	9	9	9	9	10	10	76	125.2
10	10	10	9	9	9	10	10	77	126.9
10	10	10	9	9	10	10	10	78	128.6

Table LMN-11. Lower Monumental Dam spill pattern for gas abatement (Continued).

Spill Bay								Total Stops	Total Spill
1	2	3	4	5	6	7	8		
10	10	10	10	9	10	10	10	79	130.3
10	10	10	10	10	10	10	10	80	132.0
11	10	10	10	10	10	10	10	81	133.7
11	10	10	10	10	10	10	11	82	135.4
11	11	10	10	10	10	10	11	83	137.1
11	11	10	10	10	10	11	11	84	138.8
11	11	11	10	10	10	11	11	85	140.5
11	11	11	10	10	11	11	11	86	142.2
11	11	11	11	10	11	11	11	87	143.9
11	11	11	11	11	11	11	11	88	145.6
12	11	11	11	11	11	11	11	89	147.4
12	11	11	11	11	11	11	12	90	149.2
12	12	11	11	11	11	11	12	91	151.0
12	12	11	11	11	11	12	12	92	152.8
12	12	12	11	11	11	12	12	93	154.6
12	12	12	11	11	12	12	12	94	156.4
12	12	12	12	11	12	12	12	95	158.2
12	12	12	12	12	12	12	12	96	160.0

1	NPD RESERVOIR CONTROL CENTER HOURLY OPERATION DATA REPORT					PROJECT- LMN	LOWER MONUMENTAL DAM Tuesday August 20, 2013			
	GROSS GEN MW	STA USE MW	----- -- TOTAL	OUTFLOW IN KCFS POWER	----- -- SPILL	EL AT POWERHOUSE IN FEET + MSL FOREBAY TAILWATR	AVG HEAD FT	SUPR CAP MW	UNIT ON RMT	STATUS ON LINE AVL
1		1	22.20	14.30	7.30	537.50	437.83	99.67		
2		1	22.10	14.20	7.30	537.45	437.87	99.58		
3		1	22.10	14.30	7.30	537.54	437.78	99.76		
4		1	22.10	14.30	7.30	537.47	437.83	99.64		
5		1	22.20	14.30	7.30	537.56	437.78	99.78		
6		1	22.20	14.40	7.30	537.58	438.06	99.52		
7		1	22.80	13.50	7.30	537.71	437.44	100.27		
8		1	22.20	5.00	15.10	537.64	437.90	99.74		
9		1	29.10	5.00	23.50	537.66	437.83	99.83		
10		1	30.60	5.00	23.50	537.60	437.60	100.00		
11		1	28.30	5.00	22.70	537.56	437.92	99.64		
12		1	27.10	5.00	21.50	537.59	437.81	99.78		
13		1	23.70	5.00	16.60	537.47	437.49	99.98		
14		1	16.10	5.00	10.50	537.52	437.73	99.79		
15		1	17.60	5.00	10.50	537.46	437.76	99.70		
16		1	13.00	5.00	7.40	537.48	437.62	99.86		
17		1	12.90	5.00	7.30	537.49	437.45	100.04		
18		1	13.30	5.40	7.30	537.50	437.72	99.78		
19		1	22.00	14.10	7.30	537.37	437.74	99.63		
20		1	22.00	14.20	7.30	537.45	437.76	99.69		
21		1	22.10	14.20	7.30	537.33	437.92	99.41		
22		1	22.10	14.20	7.30	537.29	437.74	99.55		
23		1	22.10	14.20	7.30	537.24	437.71	99.53		
24		1	22.10	14.30	7.30	537.20	437.79	99.41		
TOT		17								
AVG		1	21.75	10.00	10.87	537.49	437.75	99.73		
MAX			30.60	14.40	23.50	537.71	438.06	100.27		
MIN			12.90	5.00	7.30	537.20	437.44	99.41		

Table LMN-11. Lower Monumental Dam spill pattern for gas abatement.

[illegible]

Amended 8/21/2013 for total spill ≤ 7.7 kcfs with no RSW.

Highlighted cells modified from 2006.

# of Gate Stops per Spillbay								Total Stops	Total Spill
1	2	3	4	5	6	7	8		
1								1	1.1
1								1	1.1
1	1							2	2.2
1	1					1		3	3.3
1	1	1				1		4	4.4
1	1	1			1	1		5	5.5
1	1	1	1		1	1		6	6.6
1	1	1	1	1	1	1		7	7.7

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

August 21, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Libby Operations

Adam Price, Seattle District COE, reported that the pool elevation will pass below 2450' on Friday, so flows at Libby will need to be reduced in order to meet a target elevation of 2449' at the end of the month. Starting tomorrow (Thursday 8/22), a ramp down of 1 kcfs/day will be implemented to reach 10 kcfs outflows by Monday. On Monday, additional adjustment will be made if necessary to set a flow for the remainder of the month that will result in an elevation as close as possible to 2449. September discharges are expected to hold around 6 kcfs to support the Kootenai Tribe habitat work.

Lower Monumental Dam Juvenile Transport

Doug Baus, COE, updated the group on recent recommendations and proposed operation changes for juvenile transportation from Lower Monumental Dam. Due to fish conditions (Columnaris outbreak, low abundance, and high mortality), the region agreed at the August 14 TMT to stop transport and go to full-flow bypass with condition sampling every third day. Conditions have since improved and FPAC now recommends resuming normal transport operations. Baus indicated that the project can resume collecting for transport as early as today and begin every other day trucking tomorrow 8/22.

There was inquiry as to if a study has been done to assess survival rates associated with transporting and bypass. Paul Wagner, NOAA, assured that there is data, however, a formal report has not been released. Although data has been collected since 2004, there are still uncertainties around mortality rates of fish that were bypassed and overwinter in the hydrosystem. A method to account for this is needed to make a fair comparison between transport and bypass.

Action: Project managers will resume juvenile collection as soon as possible and begin every other day trucking of juvenile fish.

Lower Monumental Dam Low Flow Spill Pattern

Doug Baus informed the group that COE is going to have to alter operations at Lower Monumental in order to maintain MOP for navigation safety. This issue surfaced due to low flows that caused outflows to exceed inflows, which would draft the pool below MOP. With the current spill pattern, the RSW spills a fixed rate of approximately 7.5 kcfs. At current river flows, there are times when the project must spill less than this, so the RSW will be closed and spill distributed through other bays. Doug added that the inflow forecast shows a continued decline. In order to maintain MOP at Lower Monumental and other Snake River projects, the COE is proposing a spill pattern with no RSW at lower spill rates, based on the non-RSW pattern in the 2006 Fish Passage Plan and modified with bay 8 closed. Paul Wagner, NOAA, recommended based on discussions with Bill Hevlin, NOAA, that the COE implement a uniform spill pattern, with a preference to spill through north bays near the fish ladder.

Action: When flows are too low to operate at minimum generation and maintain spill over the RSW (approximately 7.5 kcfs), the COE will close the RSW and implement the 2006 Fish Passage Plan spill pattern, excluding Bay 8, to spill the remainder of flow above that required for minimum generation (~11.5 kcfs). Paul Wagner will discuss the operation with other NOAA biologists and provide COE with any additional input on the spill pattern. This operation will be implemented on August 21st and continue through the end of the spill season on August 31st at 2400 hours.

Little Goose Dam Low Flow Spill Change

The current flow situation at Little Goose is similar to that at Lower Monumental; due to low flows the project cannot hold a constant spill at 7kcfs, operate at minimum generation and maintain MOP at the same time. As a result, COE will operate to minimum generation and spill the remainder of inflow. Having the flexibility to adjust the spill rates will allow for the COE to maintain MOP at Little Goose Dam as well as the other projects on the Snake River.

Charles Morrill, WDFW, suggested that it will be important to monitor the adult fish passage as this operation moves forward and adjust the spill pattern towards the fish ladder if necessary.

Action: Effective today the COE will discontinue the constant 7 kcfs spill operation and operate at minimum generation and spill the remainder of inflow. This operation will be implemented on August 21st and continue through the end of the spill season on August 31st at 2400 hours.

Lower Granite Dam Adult Ladder Auxiliary Pump Operation

Doug Baus reported that the additional auxiliary pumps installed at Lower Granite are still running to pump cooler water into the ladder. At some point, the pumps will need to be shut off in order to resume the adult trap operation, but it is uncertain as to when that should occur. The region (including TMT and other affected stakeholders like the researchers) generally agreed that the preference is to shut off the auxiliary pumps and get the fish trap running as soon as temperatures are within operating criteria defined in the Fish Passage Plan (less than 72°F). Current temperatures are still too high to operate the trap.

This operation came to TMT due to adult Sockeye passage issues; guidance will now be transferred back to Project Operators and other on-site staff and researchers that are most familiar with the trap.

Dworshak Temperature Control Operation

Jeremy Giovando, Walla Walla District COE, reported that despite some divergence in the model, they are still capturing temperature trends at Dworshak. The flexibility for decreasing discharge is limited in August as compared to July, however, the project has been able to maintain temperatures at Lower Granite. Beginning August 22nd a 7.3kcfs discharge will be implemented and held through the end of the month. Dworshak Board members have convened and coordinated the following operation for the use of the Nez Perce Tribe's 200 kaf in Dworshak Reservoir: 1) on or about August 31 Dworshak will be drafted to approximately elevation 1535 feet and discharge is expected to be about 7.0 kcfs, 2) maintain discharge at approximately 7.0 kcfs for approximately 10 days (September 10th), 3) on about September 11th reduce discharge to 5.9 kcfs, 4) on about September 14th reduce discharge to 4.8 kcfs, 5) on about September 18th reduce discharge to 2.4 kcfs and 6) reduce to minimum outflow (about 1.5 kcfs) when the reservoir pool drafts to elevation 1520 (forecasted to be about September 22nd). This operation is

similar to operations in previous years, although flows are lower this year. It is expected that warm air temperatures will continue through September, however, solar radiation will decrease as we move into fall.

Action: Walla Walla District will continue to provide operation updates at future TMT meetings and share temperature modeling as long as it is still being run.

Treaty Fishing

Kyle Dittmer, CRITFC, reported that SOR 2013-C6 is currently being implemented; the SOR started on August 19th and will continue until August 21st, with additional fishing during the periods August 26-30th and September 3-7th. The SOR calls for a constant 1.5ft elevation in the Bonneville, The Dalles and John Day pools. There are currently 403 nets in the water: 177 in Oregon and 326 in Washington. There are 179 nets in the Bonneville pool, 89 in The Dalles and 135 in the John Day pool.

Kyle mentioned that this season is largely commercial and tribal members will be selling fish in locations noted on the CRITFC website. He reminded the group that salmon tastes really good BBQ'd!

Action/Planned Operation: The Corps was implementing the request.

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End of MOP

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Action/Planned Operation: Starting September 1st, as a soft constraint the BPA and Corps will commit to an operation for no net fill for the Snake River Projects until the Nez Perce's 200 kaf of water is released from Dworshak which is currently estimated to occur on September 22nd. This operation is consistent with the end of MOP operation implemented in 2012.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects. Grand Coulee was at elevation 1280 feet. Hungry Horse was at elevation 3555 feet, with current 2.2 kcfs outflows and inflows currently averaging 600 cfs. They are expected to hold at 2.2 until the end of August and adjust if necessary in September. Hungry Horse is targeting elevation of 3,550 feet for September 30. Lisa Wright, COE, reported on projects. Libby was at elevation 2450.84 feet, with 7.6 kcfs inflows and 14 kcfs outflows. Priest Rapids inflows were at 118.9 kcfs. Dworshak was at elevation 1545.99 feet, with 0.8 kcfs inflows and 8.1 kcfs outflows. Lower Granite average inflows were 19.1 kcfs; McNary average inflows were 145.5 kcfs; and Bonneville average inflows were 150.3 kcfs.

Fish – Paul Wagner, NOAA, reported on fish passage. Adult fall Chinook at Bonneville are averaging between 1,300-4,000/day; approximately 34,000 have passed and the run is expected to total 400,000. Wild steelhead are close to but below the 10 year average at current counts of 75,000, and the total count for steelhead is below the 10 year average at current counts of 156,000. Lamprey counts at Bonneville are below the 10 year average. The lamprey index shows a total 28,600 to date.

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Water quality – Laura Hamilton, COE, reported on water quality. There were 39 TDG exceedances in June and 28 in July. All exceedances were due either to ‘professional judgment’ or involuntary spill.

Power system – Nothing to report.

The next TMT meeting will be a face to face on September 4th from 9:00-12:00.

Agenda topics will include:

- Snake River projects: low flow spill patterns and operations
- Dworshak temperature control operation
- Libby operation
- Treaty fishing (tentative)
- COE Lower Granite pool sedimentation plan
- Operation review

Columbia River Regional Forum

TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

August 21, 2013

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BOR, NOAA, Oregon, BPA, Idaho, Washington, Montana, USFWS, CRITFC, Colville Tribe, Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of Meeting Minutes for July 24, 26, 29, 31 and August 2, 5 and 14

Because people had not yet had time to read the official minutes and facilitator's notes for all of these meetings, review was postponed until the next TMT meeting September 4.

3. Libby Operations

Adam Price, Seattle District COE, reported that the pool elevation will pass below 2450' on Friday, so outflows at Libby will need to be reduced in order to meet a target elevation of 2449' at the end of the month. Starting tomorrow (Thursday 8/22), a ramp down of 1 kcfs/day will be implemented to reach 10 kcfs outflows by Monday. On Monday, additional adjustment will be made if necessary to set a flow for the remainder of the month that will result in an elevation as close as possible to 2449'. September discharges are expected to hold around 6 kcfs to support the Kootenai Tribe sturgeon habitat work.

Price asked the Salmon Managers whether these plans are consistent with their goals for Libby. Representatives for **Montana, Washington** and **NOAA** agreed this is a good operation.

4. Lower Monumental Dam Juvenile Transportation

In the August 14 TMT call, FPAC's recommendation was to bypass juveniles to the river at Lower Monumental due to concerns about columnaris and mortality, Baus recalled. Since then, FPAC has proposed that the COE resume truck transport at Lower Monumental every other day. Baus asked TMT members for their views of that proposal.

It's consistent with FPAC's recommendation because the reason for full bypass was a rise in columnaris, Paul Wagner, NOAA, said. However, no sooner was the decision made to bypass all fish than new information indicated no signs of columnaris

and little to no mortality, therefore it would be safe to resume normal truck transport operations every other day.

Baus said the COE supports resumption of transport, and Ken Fone, COE Walla Walla, noted that staff at the project are ready to resume transport operations whenever they are asked to do so. Dave Statler, Nez Perce Tribe, asked whether there is ongoing assessment of smolt-to-adult return rates (SARs) for truck transport every other day. A large study under way since 2004 indicates that fish trucked at this time of year have very high SARs of 3-8%, Wagner replied. However, fish leaving the river system in spring also have high SARs of 3-7%. The unknown factor for these fish is winter survival and mortality rates for November to March. Charles Morrill, Washington, agreed there aren't a lot of data available for this period.

Russ Kiefer said **Idaho** doesn't have a strong opinion either way on this issue, therefore the state has no objection to resuming transport. Idaho is currently completing a complex analysis of adult fall Chinook returns that should provide a clearer picture of how fall Chinook adults fare early in the year. Morrill added that earlier tagging of fall Chinook typically does not begin until the end of September, leaving a data gap period in August of every year. It's not uncommon to see a sharp spike in columnaris at the lower Snake projects this time of year coinciding with warm water temperatures.

5. Lower Monumental Dam Low Flow Spill Pattern

As of last night the Action Agencies (AAs) realized it would be difficult to maintain Lower Monumental Dam (LMN) forebay in the Minimum Operating Pool (MOP) range because spill with the RSW in operation could not go lower than approximately 7.3 kcfs. The project is currently operating unit 5 at minimum generation (14.3 kcfs) during unit outages for Doble testing, resulting in minimum outflows of 7.3 kcfs RSW + 14.3 kcfs minimum generation = 21.6 kcfs. River flows have been below this level, resulting in outflows exceeding inflows and a draft of the reservoir to the bottom of the MOP range, Baus reported. Additionally, the current NWRFC forecast suggests this problem will likely persist over the next 10 days as inflows are forecasted to decrease. If outflows continue to exceed inflows as forecasted, the AAs will be unable to maintain MOP, which would adversely impact navigation safety.

To address this problem the COE proposed, effective today, a change in the spill pattern at Lower Monumental: close the RSW in spillbay 8 and implement a pattern consistent with Table LMN-11 in the 2006 Fish Passage Plan as modified for no spill in bay 8. Baus proposed shifting the stops allocated to bay 8 in the 2006 table over to bay 7. The proposal changes the current operation of minimum generation with fixed RSW spill to minimum generation with a modified spill pattern at total spill rates less than approximately 7.3 kcfs that includes closure of the RSW. The goal of this operation is to provide the flexibility needed to balance Lower Monumental inflows and discharges on an hourly basis in order to maintain MOP during periods of low flows. The operation will continue for the rest of spill season.

Jim Litchfield, Montana, asked whether it would still be possible at current inflow rates to spill 7 kcfs with minimum generation. Baus said the COE is unable to maintain fixed outflows that exceed inflows and maintain MOP. Laura Hamilton, COE, noted that changes at any one dam affect the whole Snake River system; another agenda item today deals with water shortages at Little Goose. Lisa Wright, COE said the uniform pattern for Lower Monumental in the 2013 FPP doesn't go below spill of 8.6 kcfs, due to the allocation of 7 kcfs through bay 8. The COE is working on defining spill rates with bay 8 closed. The spill pattern shown in Table LMN-11 in the 2006 FPP was modeled at ERDC, so it would be advisable to use that pattern to the greatest extent possible, Baus noted.

Litchfield proposed that the 2006 FPP pattern be implemented by deleting stops in the bay 8 column then adjusting the total spill column, rather than shifting stops around which would be inconsistent with what was modeled at ERDC. Wagner will consult with NOAA experts on this spill pattern and get back to the COE with refinements in the spill pattern if necessary. There was consensus today among TMT members present to adopt this approach. Information on any subsequent changes to the Lower Monumental spill pattern will be posted to this item on today's agenda.

6. Little Goose Dam Low Flow Spill Change

The AAs are having difficulty maintaining the Little Goose Dam (LGS) low flow fixed spill operation of 7 kcfs described in the FOP (previously coordinated at TMT) at various times in the day when inflows have been insufficient to provide fixed spill and minimum generation. When outflows are greater than inflows, LGS is unable to maintain MOP at the project. For example, yesterday at 1400 hours, project outflows of approximately 16 kcfs resulted in 11.6 kcfs minimum generation and 3.7 kcfs spill.

The COE therefore proposed to reduce the current 7 kcfs constant spill operation down to 5 kcfs beginning today. This will provide greater ability during this low flow period to maintain MOP at all lower Snake River projects. The COE will attempt to maintain 5 kcfs releases to the extent possible. Kiefer commented that minimum generation at Little Goose is 11.5 kcfs but yesterday generation rose to 17 kcfs, so perhaps maintaining minimum generation all day would have made it possible to maintain 7.5 kcfs spill. Scott Bettin, BPA, proposed to spill at LGS consistent with minimum generation operations at other FCRPS project during low flow periods, resulting in operating at minimum generation (approximately 11.5 kcfs) and spilling the remainder of inflow.

In response to this conversation, the AAs will discontinue the 7 kcfs spill operation and operate to minimum generation and spill the remainder of outflow. **Montana, Idaho,** and other TMT members agreed this is a good low flow operation. The AAs will implement this operation effective today through the remainder of spill season (August 31 at 2400 hours).

7. Lower Granite Dam Adult Ladder Auxiliary Pump Operation

As of the last TMT meeting, Idaho was planning to coordinate further use of the additional adult ladder auxiliary pumps and the adult trap at Lower Granite, Baus recalled. When the pumps are turned on in order to cool temperatures in the adult ladder, the trap has insufficient water depth to operate. After coordinating with Idaho and other stakeholders, the COE proposed to continue to work with the region outside of TMT on operation of the pumps vs. the trap. No specific end date was set for this balancing act.

Wagner pointed out that per the FPP, the trap doesn't operate unless temperatures in the ladder are 72 degrees F or below. Workers at the project are in the best position to monitor that and begin operating the trap as soon as conditions are within FPP criteria. Morrill said **Washington** supports the approach of letting project staff take the lead in starting the trap operation. Meanwhile, the two auxiliary pumps will remain in operation to provide cooler water in the adult ladder.

TMT members will be notified via email of any changes in the Lower Granite operation. TMT will revisit this issue at its next meeting September 4.

8. Dworshak Temperature Control Operation

Jeremy Giovando, COE, reported. Attachment 8a to today's agenda shows a slight warming trend in the Lower Granite tailwater temperature. The model has been over-sensitive to the operations at Lower Granite over the past few weeks, resulting in increased divergence between forecasted and actual water temperatures. In response to these conditions, the COE plans to decrease Dworshak discharges to 7 kcfs tomorrow and hold that discharge for the remainder of August.

Dworshak Board members have convened and coordinated the following operation for the use of the Nez Perce Tribe's 200 kaf in Dworshak Reservoir: 1) on or about August 31 Dworshak will be drafted to approximately elevation 1535 feet and discharge is expected to be about 7.0 kcfs, 2) maintain discharge at approximately 7.0 kcfs for approximately 10 days (September 10th), 3) on about September 11th reduce discharge to 5.9 kcfs, 4) on about September 14th reduce discharge to 4.8 kcfs, 5) on about September 18th reduce discharge to 2.4 kcfs and 6) reduce to minimum outflow (about 1.5 kcfs) when the reservoir pool drafts to elevation 1520 (forecasted to be about September 22nd). This operation is similar to operations in previous years, although flows are lower this year. It is expected that warm air temperatures will continue through September, however, solar radiation will decrease as we move into fall.

Bettin asked what the lowest discharges on record are from the Snake River, and whether flows in September might drop lower than the 11.5 kcfs minimum generation flow. Giovando said flows on the Snake are the lowest seen in years; Idaho Power's

Hell's Canyon complex is running out of water. The September operation will depend heavily on precipitation. Kyle Dittmer, CRITFC, noted that warm, dry weather is likely to continue through September.

TMT will revisit Dworshak flow augmentation at its next meeting September 4. Meanwhile, the COE will continue to provide modeling.

9. Treaty Fishing

SOR 2013-C6 requests a series of three-day treaty fishery operations at Bonneville, The Dalles and John Day dams from 6 am to 6 pm daily, August 19-21, August 26-30, and September 3-7, Kyle Dittmer, CRITFC, reported. The SOR requests 1.5-foot elevation bands at the three lower Columbia River pools for the fisheries.

A CRITFC-sponsored net flight found 403 nets in the pools, with 177 in Oregon and 226 in Washington. Of these, 179 (44%) are at Bonneville, 89 (22%) are at The Dalles, and 135 (34%) are at John Day. There may be additional fisheries in September depending on fish counts.

The operation is currently underway and will continue as requested, Baus said. CRITFC will keep TMT informed of tribal fishery activities.

10. Spill Priority List

The Salmon Managers conferred on yesterday's FPAC call and approved the winter spill priority list, Wagner said. The wintertime list attached to this item on today's agenda will go into effect September 1, Baus replied.

11. End of MOP Operations

When MOP operations end on August 31 at 2400 hours, once again the Action Agencies will commit to a no-net-fill operation across the three lower Snake River projects, Tony Norris, BPA, reported. These projects will return to their current MOP elevation, as adjusted at LWG and LGS for navigational safety, around September 21 to coincide with the end of Dworshak temperature augmentation releases. These are all soft constraints.

Norris noted that MOP elevations could rise at Lower Granite and Little Goose if flows are low enough. Wagner said this plan of action sounds fine in terms of fish concerns.

12. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3555.0 feet, releasing 2.2 kcfs through the end of August. Inflows over the last 3 days averaged 600 cfs and are

gradually receding. Discharges are projected to drop by another 200-300 cfs in September. The current end of September elevation target is 3550 feet.

Grand Coulee is at elevation 1280.3 feet, with a target elevation of 1277.7 feet at the end of August. Libby is at elevation 2450.8 feet, with inflows of 7.6 kcfs and releases of 14 kcfs. Priest Rapids inflows are 118.9 kcfs. Dworshak is at elevation 1545.99 feet, with inflows of 0.8 kcfs and releases of 8.1 kcfs.

McNary daily average inflows are 145.5 kcfs. Lower Granite daily average inflows are 19.1 kcfs. Bonneville daily average inflows are 150.3 kcfs.

b. Fish. Adults: Fall chinook passage is relatively strong, with weekly counts at Bonneville in the 1300-4000 range. Total season count is 34,000 to date, with a projection of 400,000 fish returning to Bonneville Dam. Present fall chinook adult counts are above the 10 year average. The same goes for jack counts of 5660, which are well above the 10 year average.

Steelhead passage is 2000-3000 per day, with a total of 156,000 to date, which is below the 10 year average. Wild steelhead passage is closer to the 10 year average, with 75,000 fish to date. Lamprey passage at Bonneville is 21,800 to date, which is below the 10 year average but higher than the past several years. Discrepancies in adult sockeye counts continue at Lower Granite. The conversion rate at the Redfish Lake trap is currently around 10%, which is good considering this year's low flows. Kiefer said Idaho is conducting two research projects on sockeye passage which should provide substantive information to correlate passage conditions and survival rates.

Juveniles: Subyearling passage is winding down as the season draws to a close. Lower Granite and Little Goose index counts are around 1000 fish per day. Sampling continues at McNary every other day, with daily passage counts ranging from 5000-10,000. These numbers are typical for this time of year. Lamprey passage peaked at McNary at 5100 in one day, but generally lamprey passage is also trending down.

c. Water Quality. There have been few exceedances in August except for Lower Granite Dam, with quite a few in both tailrace and forebay, Hamilton reported. This was the result of operating at speed-no-load for the coordinated adult ladder operation and for the roof repair. In July there were 28 TDG instances on the system, most caused by lack of load and involuntary spill when wind power came on line.

d. Power System. There was nothing to report.

8. Next TMT Meeting

The next TMT meeting will be in person on September 4.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
John Roache	BOR
Paul Wagner	NOAA
Lisa Wright	COE
Erick Van Dyke	Oregon
Tony Norris	BPA
Charles Morrill	Washington
Scott Bettin	BPA
Laura Hamilton	COE
Agnes Lut	BPA
Andy Traylor	COE
Jim Litchfield	Montana

<i>Phone:</i>	
David Wills	USFWS
Kyle Dittmer	CRITFC
Sheri Sears	Colville
Shane Scott	PPC
Heather Dohan	Puget
Adam Price	COE Seattle
Barry Espenson	CBB
Greg Moody	COE Walla Walla
Ken Fone	COE Walla Walla
Russ Kiefer	Idaho
Chris Pinney	COE Walla Walla
Dave Statler	Nez Perce Tribe
Margaret Filardo	FPC
Jeremy Giovando	COE

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

August 21, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Libby Operations

Adam Price, Seattle District COE, reported that the pool elevation will pass below 2450' on Friday, so flows at Libby will need to be reduced in order to meet a target elevation of 2449' at the end of the month. Starting tomorrow (Thursday 8/22), a ramp down of 1 kcfs/day will be implemented to reach 10 kcfs outflows by Monday. On Monday, additional adjustment will be made if necessary to set a flow for the remainder of the month that will result in an elevation as close as possible to 2449. September discharges are expected to hold around 6 kcfs to support the Kootenai Tribe habitat work.

Lower Monumental Dam Juvenile Transport

Doug Baus, COE, updated the group on recent recommendations and proposed operation changes for juvenile transportation from Lower Monumental Dam. Due to fish conditions (Columnaris outbreak, low abundance, and high mortality), the region agreed at the August 14 TMT to stop transport and go to full-flow bypass with condition sampling every third day. Conditions have since improved and FPAC now recommends resuming normal transport operations. Baus indicated that the project can resume collecting for transport as early as today and begin every other day trucking tomorrow 8/22.

There was inquiry as to if a study has been done to assess survival rates associated with transporting and bypass. Paul Wagner, NOAA, assured that there is data, however, a formal report has not been released. Although data has been collected since 2004, there are still uncertainties around mortality rates of fish that were bypassed and overwinter in the hydrosystem. A method to account for this is needed to make a fair comparison between transport and bypass.

Action: Project managers will resume juvenile collection as soon as possible and begin every other day trucking of juvenile fish.

Lower Monumental Dam Low Flow Spill Pattern

Doug Baus informed the group that COE is going to have to alter operations at Lower Monumental in order to maintain MOP for navigation safety. This issue surfaced due to low flows that caused outflows to exceed inflows, which would draft the pool below MOP. With the current spill pattern, the RSW spills a fixed rate of approximately 7.5 kcfs. At current river flows, there are times when the project must spill less than this, so the RSW will be closed and spill distributed through other bays. Doug added that the inflow forecast shows a continued decline. In order to maintain MOP at Lower Monumental and other Snake River projects, the COE is proposing a spill pattern with no RSW at lower spill rates, based on the non-RSW pattern in the 2006 Fish Passage Plan and modified with bay 8 closed. Paul Wagner, NOAA, recommended based on discussions with Bill Hevlin, NOAA, that the COE implement a uniform spill pattern, with a preference to spill through north bays near the fish ladder.

Action: When flows are too low to operate at minimum generation and maintain spill over the RSW (approximately 7.5 kcfs), the COE will close the RSW and implement the 2006 Fish Passage Plan spill pattern, excluding Bay 8, to spill the remainder of flow above that required for minimum generation (~11.5 kcfs). Paul Wagner will discuss the operation with other NOAA biologists and provide COE with any additional input on the spill pattern. This operation will be implemented on August 21st and continue through the end of the spill season on August 31st at 2400 hours.

Little Goose Dam Low Flow Spill Change

The current flow situation at Little Goose is similar to that at Lower Monumental; due to low flows the project cannot hold a constant spill at 7kcfs, operate at minimum generation and maintain MOP at the same time. As a result, COE will operate to minimum generation and spill the remainder of inflow. Having the flexibility to adjust the spill rates will allow for the COE to maintain MOP at Little Goose Dam as well as the other projects on the Snake River.

Charles Morrill, WDFW, suggested that it will be important to monitor the adult fish passage as this operation moves forward and adjust the spill pattern towards the fish ladder if necessary.

Action: Effective today the COE will discontinue the constant 7 kcfs spill operation and operate at minimum generation and spill the remainder of inflow. This operation will be implemented on August 21st and continue through the end of the spill season on August 31st at 2400 hours.

Lower Granite Dam Adult Ladder Auxiliary Pump Operation

Doug Baus reported that the additional auxiliary pumps installed at Lower Granite are still running to pump cooler water into the ladder. At some point, the pumps will need to be shut off in order to resume the adult trap operation, but it is uncertain as to when that should occur. The region (including TMT and other affected stakeholders like the researchers) generally agreed that the preference is to shut off the auxiliary pumps and get the fish trap running as soon as temperatures are within operating criteria defined in the Fish Passage Plan (less than 72°F). Current temperatures are still too high to operate the trap.

This operation came to TMT due to adult Sockeye passage issues; guidance will now be transferred back to Project Operators and other on-site staff and researchers that are most familiar with the trap.

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Jeremy Giovando, Walla Walla District COE, reported that despite some divergence in the model, they are still capturing temperature trends at Dworshak. The flexibility for decreasing discharge is limited in August as compared to July, however, the project has been able to maintain temperatures at Lower Granite. Beginning August 22nd a 7.3kcfs discharge will be implemented and held through the end of the month. Dworshak Board members have convened and coordinated the following operation for the use of the Nez Perce Tribe's 200 kaf in Dworshak Reservoir: 1) on or about August 31 Dworshak will be drafted to approximately elevation 1535 feet and discharge is expected to be about 7.0 kcfs, 2) maintain discharge at approximately 7.0 kcfs for approximately 10 days (September 10th), 3) on about September 11th reduce discharge to 5.9 kcfs, 4) on about September 14th reduce discharge to 4.8 kcfs, 5) on about September 18th reduce discharge to 2.4 kcfs and 6) reduce to minimum outflow (about 1.5 kcfs) when the reservoir pool drafts to elevation 1520 (forecasted to be about September 22nd). This operation is

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Columbia River Regional Forum

TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

August 21, 2013

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BOR, NOAA, Oregon, BPA, Idaho, Washington, Montana, USFWS, CRITFC, Colville Tribe, Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of Meeting Minutes for July 24, 26, 29, 31 and August 2, 5 and 14

Because people had not yet had time to read the official minutes and facilitator's notes for all of these meetings, review was postponed until the next TMT meeting September 4.

3. Libby Operations

Adam Price, Seattle District COE, reported that the pool elevation will pass below 2450' on Friday, so outflows at Libby will need to be reduced in order to meet a target elevation of 2449' at the end of the month. Starting tomorrow (Thursday 8/22), a ramp down of 1 kcfs/day will be implemented to reach 10 kcfs outflows by Monday. On Monday, additional adjustment will be made if necessary to set a flow for the remainder of the month that will result in an elevation as close as possible to 2449'. September discharges are expected to hold around 6 kcfs to support the Kootenai Tribe sturgeon habitat work.

Price asked the Salmon Managers whether these plans are consistent with their goals for Libby. Representatives for **Montana, Washington** and **NOAA** agreed this is a good operation.

4. Lower Monumental Dam Juvenile Transportation

In the August 14 TMT call, FPAC's recommendation was to bypass juveniles to the river at Lower Monumental due to concerns about columnaris and mortality, Baus recalled. Since then, FPAC has proposed that the COE resume truck transport at Lower Monumental every other day. Baus asked TMT members for their views of that proposal.

It's consistent with FPAC's recommendation because the reason for full bypass was a rise in columnaris, Paul Wagner, NOAA, said. However, no sooner was the decision made to bypass all fish than new information indicated no signs of columnaris

and little to no mortality, therefore it would be safe to resume normal truck transport operations every other day.

Baus said the COE supports resumption of transport, and Ken Fone, COE Walla Walla, noted that staff at the project are ready to resume transport operations whenever they are asked to do so. Dave Statler, Nez Perce Tribe, asked whether there is ongoing assessment of smolt-to-adult return rates (SARs) for truck transport every other day. A large study under way since 2004 indicates that fish trucked at this time of year have very high SARs of 3-8%, Wagner replied. However, fish leaving the river system in spring also have high SARs of 3-7%. The unknown factor for these fish is winter survival and mortality rates for November to March. Charles Morrill, Washington, agreed there aren't a lot of data available for this period.

Russ Kiefer said **Idaho** doesn't have a strong opinion either way on this issue, therefore the state has no objection to resuming transport. Idaho is currently completing a complex analysis of adult fall Chinook returns that should provide a clearer picture of how fall Chinook adults fare early in the year. Morrill added that earlier tagging of fall Chinook typically does not begin until the end of September, leaving a data gap period in August of every year. It's not uncommon to see a sharp spike in columnaris at the lower Snake projects this time of year coinciding with warm water temperatures.

5. Lower Monumental Dam Low Flow Spill Pattern

As of last night the Action Agencies (AAs) realized it would be difficult to maintain Lower Monumental Dam (LMN) forebay in the Minimum Operating Pool (MOP) range because spill with the RSW in operation could not go lower than approximately 7.3 kcfs. The project is currently operating unit 5 at minimum generation (14.3 kcfs) during unit outages for Doble testing, resulting in minimum outflows of 7.3 kcfs RSW + 14.3 kcfs minimum generation = 21.6 kcfs. River flows have been below this level, resulting in outflows exceeding inflows and a draft of the reservoir to the bottom of the MOP range, Baus reported. Additionally, the current NWRFC forecast suggests this problem will likely persist over the next 10 days as inflows are forecasted to decrease. If outflows continue to exceed inflows as forecasted, the AAs will be unable to maintain MOP, which would adversely impact navigation safety.

To address this problem the COE proposed, effective today, a change in the spill pattern at Lower Monumental: close the RSW in spillbay 8 and implement a pattern consistent with Table LMN-11 in the 2006 Fish Passage Plan as modified for no spill in bay 8. Baus proposed shifting the stops allocated to bay 8 in the 2006 table over to bay 7. The proposal changes the current operation of minimum generation with fixed RSW spill to minimum generation with a modified spill pattern at total spill rates less than approximately 7.3 kcfs that includes closure of the RSW. The goal of this operation is to provide the flexibility needed to balance Lower Monumental inflows and discharges on an hourly basis in order to maintain MOP during periods of low flows. The operation will continue for the rest of spill season.

Jim Litchfield, Montana, asked whether it would still be possible at current inflow rates to spill 7 kcfs with minimum generation. Baus said the COE is unable to maintain fixed outflows that exceed inflows and maintain MOP. Laura Hamilton, COE, noted that changes at any one dam affect the whole Snake River system; another agenda item today deals with water shortages at Little Goose. Lisa Wright, COE said the uniform pattern for Lower Monumental in the 2013 FPP doesn't go below spill of 8.6 kcfs, due to the allocation of 7 kcfs through bay 8. The COE is working on defining spill rates with bay 8 closed. The spill pattern shown in Table LMN-11 in the 2006 FPP was modeled at ERDC, so it would be advisable to use that pattern to the greatest extent possible, Baus noted.

Litchfield proposed that the 2006 FPP pattern be implemented by deleting stops in the bay 8 column then adjusting the total spill column, rather than shifting stops around which would be inconsistent with what was modeled at ERDC. Wagner will consult with NOAA experts on this spill pattern and get back to the COE with refinements in the spill pattern if necessary. There was consensus today among TMT members present to adopt this approach. Information on any subsequent changes to the Lower Monumental spill pattern will be posted to this item on today's agenda.

6. Little Goose Dam Low Flow Spill Change

The AAs are having difficulty maintaining the Little Goose Dam (LGS) low flow fixed spill operation of 7 kcfs described in the FOP (previously coordinated at TMT) at various times in the day when inflows have been insufficient to provide fixed spill and minimum generation. When outflows are greater than inflows, LGS is unable to maintain MOP at the project. For example, yesterday at 1400 hours, project outflows of approximately 16 kcfs resulted in 11.6 kcfs minimum generation and 3.7 kcfs spill.

The COE therefore proposed to reduce the current 7 kcfs constant spill operation down to 5 kcfs beginning today. This will provide greater ability during this low flow period to maintain MOP at all lower Snake River projects. The COE will attempt to maintain 5 kcfs releases to the extent possible. Kiefer commented that minimum generation at Little Goose is 11.5 kcfs but yesterday generation rose to 17 kcfs, so perhaps maintaining minimum generation all day would have made it possible to maintain 7.5 kcfs spill. Scott Bettin, BPA, proposed to spill at LGS consistent with minimum generation operations at other FCRPS project during low flow periods, resulting in operating at minimum generation (approximately 11.5 kcfs) and spilling the remainder of inflow.

In response to this conversation, the AAs will discontinue the 7 kcfs spill operation and operate to minimum generation and spill the remainder of outflow. **Montana, Idaho,** and other TMT members agreed this is a good low flow operation. The AAs will implement this operation effective today through the remainder of spill season (August 31 at 2400 hours).

7. Lower Granite Dam Adult Ladder Auxiliary Pump Operation

As of the last TMT meeting, Idaho was planning to coordinate further use of the additional adult ladder auxiliary pumps and the adult trap at Lower Granite, Baus recalled. When the pumps are turned on in order to cool temperatures in the adult ladder, the trap has insufficient water depth to operate. After coordinating with Idaho and other stakeholders, the COE proposed to continue to work with the region outside of TMT on operation of the pumps vs. the trap. No specific end date was set for this balancing act.

Wagner pointed out that per the FPP, the trap doesn't operate unless temperatures in the ladder are 72 degrees F or below. Workers at the project are in the best position to monitor that and begin operating the trap as soon as conditions are within FPP criteria. Morrill said **Washington** supports the approach of letting project staff take the lead in starting the trap operation. Meanwhile, the two auxiliary pumps will remain in operation to provide cooler water in the adult ladder.

TMT members will be notified via email of any changes in the Lower Granite operation. TMT will revisit this issue at its next meeting September 4.

8. Dworshak Temperature Control Operation

Jeremy Giovando, COE, reported. Attachment 8a to today's agenda shows a slight warming trend in the Lower Granite tailwater temperature. The model has been over-sensitive to the operations at Lower Granite over the past few weeks, resulting in increased divergence between forecasted and actual water temperatures. In response to these conditions, the COE plans to decrease Dworshak discharges to 7 kcfs tomorrow and hold that discharge for the remainder of August.

Dworshak Board members have convened and coordinated the following operation for the use of the Nez Perce Tribe's 200 kaf in Dworshak Reservoir: 1) on or about August 31 Dworshak will be drafted to approximately elevation 1535 feet and discharge is expected to be about 7.0 kcfs, 2) maintain discharge at approximately 7.0 kcfs for approximately 10 days (September 10th), 3) on about September 11th reduce discharge to 5.9 kcfs, 4) on about September 14th reduce discharge to 4.8 kcfs, 5) on about September 18th reduce discharge to 2.4 kcfs and 6) reduce to minimum outflow (about 1.5 kcfs) when the reservoir pool drafts to elevation 1520 (forecasted to be about September 22nd). This operation is similar to operations in previous years, although flows are lower this year. It is expected that warm air temperatures will continue through September, however, solar radiation will decrease as we move into fall.

Bettin asked what the lowest discharges on record are from the Snake River, and whether flows in September might drop lower than the 11.5 kcfs minimum generation flow. Giovando said flows on the Snake are the lowest seen in years; Idaho Power's

Hell's Canyon complex is running out of water. The September operation will depend heavily on precipitation. Kyle Dittmer, CRITFC, noted that warm, dry weather is likely to continue through September.

TMT will revisit Dworshak flow augmentation at its next meeting September 4. Meanwhile, the COE will continue to provide modeling.

9. Treaty Fishing

SOR 2013-C6 requests a series of three-day treaty fishery operations at Bonneville, The Dalles and John Day dams from 6 am to 6 pm daily, August 19-21, August 26-30, and September 3-7, Kyle Dittmer, CRITFC, reported. The SOR requests 1.5-foot elevation bands at the three lower Columbia River pools for the fisheries.

A CRITFC-sponsored net flight found 403 nets in the pools, with 177 in Oregon and 226 in Washington. Of these, 179 (44%) are at Bonneville, 89 (22%) are at The Dalles, and 135 (34%) are at John Day. There may be additional fisheries in September depending on fish counts.

The operation is currently underway and will continue as requested, Baus said. CRITFC will keep TMT informed of tribal fishery activities.

10. Spill Priority List

The Salmon Managers conferred on yesterday's FPAC call and approved the winter spill priority list, Wagner said. The wintertime list attached to this item on today's agenda will go into effect September 1, Baus replied.

11. End of MOP Operations

When MOP operations end on August 31 at 2400 hours, once again the Action Agencies will commit to a no-net-fill operation across the three lower Snake River projects, Tony Norris, BPA, reported. These projects will return to their current MOP elevation, as adjusted at LWG and LGS for navigational safety, around September 21 to coincide with the end of Dworshak temperature augmentation releases. These are all soft constraints.

Norris noted that MOP elevations could rise at Lower Granite and Little Goose if flows are low enough. Wagner said this plan of action sounds fine in terms of fish concerns.

12. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3555.0 feet, releasing 2.2 kcfs through the end of August. Inflows over the last 3 days averaged 600 cfs and are

gradually receding. Discharges are projected to drop by another 200-300 cfs in September. The current end of September elevation target is 3550 feet.

Grand Coulee is at elevation 1280.3 feet, with a target elevation of 1277.7 feet at the end of August. Libby is at elevation 2450.8 feet, with inflows of 7.6 kcfs and releases of 14 kcfs. Priest Rapids inflows are 118.9 kcfs. Dworshak is at elevation 1545.99 feet, with inflows of 0.8 kcfs and releases of 8.1 kcfs.

McNary daily average inflows are 145.5 kcfs. Lower Granite daily average inflows are 19.1 kcfs. Bonneville daily average inflows are 150.3 kcfs.

b. Fish. Adults: Fall chinook passage is relatively strong, with weekly counts at Bonneville in the 1300-4000 range. Total season count is 34,000 to date, with a projection of 400,000 fish returning to Bonneville Dam. Present fall chinook adult counts are above the 10 year average. The same goes for jack counts of 5660, which are well above the 10 year average.

Steelhead passage is 2000-3000 per day, with a total of 156,000 to date, which is below the 10 year average. Wild steelhead passage is closer to the 10 year average, with 75,000 fish to date. Lamprey passage at Bonneville is 21,800 to date, which is below the 10 year average but higher than the past several years. Discrepancies in adult sockeye counts continue at Lower Granite. The conversion rate at the Redfish Lake trap is currently around 10%, which is good considering this year's low flows. Kiefer said Idaho is conducting two research projects on sockeye passage which should provide substantive information to correlate passage conditions and survival rates.

Juveniles: Subyearling passage is winding down as the season draws to a close. Lower Granite and Little Goose index counts are around 1000 fish per day. Sampling continues at McNary every other day, with daily passage counts ranging from 5000-10,000. These numbers are typical for this time of year. Lamprey passage peaked at McNary at 5100 in one day, but generally lamprey passage is also trending down.

c. Water Quality. There have been few exceedances in August except for Lower Granite Dam, with quite a few in both tailrace and forebay, Hamilton reported. This was the result of operating at speed-no-load for the coordinated adult ladder operation and for the roof repair. In July there were 28 TDG instances on the system, most caused by lack of load and involuntary spill when wind power came on line.

d. Power System. There was nothing to report.

8. Next TMT Meeting

The next TMT meeting will be in person on September 4.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
John Roache	BOR
Paul Wagner	NOAA
Lisa Wright	COE
Erick Van Dyke	Oregon
Tony Norris	BPA
Charles Morrill	Washington
Scott Bettin	BPA
Laura Hamilton	COE
Agnes Lut	BPA
Andy Traylor	COE
Jim Litchfield	Montana

<i>Phone:</i>	
David Wills	USFWS
Kyle Dittmer	CRITFC
Sheri Sears	Colville
Shane Scott	PPC
Heather Dohan	Puget
Adam Price	COE Seattle
Barry Espenson	CBB
Greg Moody	COE Walla Walla
Ken Fone	COE Walla Walla
Russ Kiefer	Idaho
Chris Pinney	COE Walla Walla
Dave Statler	Nez Perce Tribe
Margaret Filardo	FPC
Jeremy Giovando	COE



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

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SYSTEM OPERATIONAL REQUEST: 2013 C-6

TO: Col. John S. Kem COE-NWD
James D. Barton COE-NWD-NP-Water Management
K. Kanbergs, S. Burrell, D. Baus COE-NWD-NP-WM-RCC
D. Feil, R. Peters, D. Ponganis COE-NWD-PDD (Fish Management Office)
JR Inglis/Paul Cloutier COE-Portland District/NWD (Tribal Liaison)
Lorri Lee USBR- PNW Regional Director
Elliot Mainzer Acting BPA Administrator
Steve Oliver, Greg Delwiche BPA-PG-5
Scott Bettin, Tony Norris BPA-Operations Planning-PGPO
Stan Speaks, Keith Hatch BIA, Northwest Regional Office

FROM: B. Paul Lumley, *Executive Director*

DATE: August 14, 2013

SUBJECT: **Operation of the Lower Columbia Pools for the Autumn 2013 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the autumn 2013 Treaty fishery. This effort supports the 2013 ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

Monday, August 19, 2013, 6 am, through Wednesday, August 21, 2013, 6 pm.

Monday, August 26, 2013, 6 am, through Friday, August 30, 2013, 6 pm.

Tuesday, September 3, 2013, 6 am, through Saturday, September 7, 2013, 6 pm.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

At this time we anticipate additional treaty fisheries later in September. CRITFC will notify the Corps with specific times for the tribal fishery after each Compact hearing, via a new SOR.

JUSTIFICATION:

The 2013 autumn treaty fishing season is of critical importance to CRITFC's member tribes. The escapement (Columbia at Bonneville Dam) of an estimated of **460,000 (Columbia at Bonneville Dam) adult upriver fall Chinook (above average rank), 322,000 Steelhead (below average rank), and 135,000 Coho (near normal rank)** will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day.

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become lost, continuing to catch fish, and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB, Friday August 16, 2013. Thank you for considering this request. Please contact Kyle Dittmer or Stuart Ellis should you have any questions at (503) 238-0667.

cc: Tribal staffs and attorneys

TECHNICAL MANAGEMENT TEAM

NOAA: Paul Wagner / Richard Domingue

OR: Erick Van Dyke

WA: Charles Morrill

Kootenai: Sue Ireland / Billy Barquin

Colville: Sheri Sears / Keith Wolf

Umatilla: Tom Lorz (CRITFC)

BOR: John Roache / Mary Mellema / Pat McGrane

COE: Doug Baus / Karl Kanbergs

USFWS: David Wills / Steve Haeseker

ID: Russ Kiefer / Pete Hassemer

MT: Jim Litchfield / Brian Marotz

Spokane: Andy Miller

Nez Perce: Dave Statler

BPA: Tony Norris / Scott Bettin / Robyn MacKay

TMT MEETING

Wednesday September 4, 2013 9:00am - 12:00pm

NOTE NEW LOCATION

911 Federal Building (USFWS)

Conference Room A

911 NE 11th Ave

Portland, Oregon

[Map](#)

TMT MEETING

Phone Number (877) 336-1274

Access Code 3871669

Security Code 7362

We have had disruptions on the phone because people are not hitting 'mute' after dial in.

Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.

Please e-mail her at rgumpert@cnnm.net or call her at (503) 248-4703.

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes - [August 21](#)
3. Treaty Fishing - Kyle Dittmer, CRITFC
4. Libby Operations - Adam Price, COE-NWS
5. Dworshak Temperature Control Operation - Steve Hall, COE-NWW

6. Lower Monumental Dam Juvenile Transportation - *Doug Baus, COE-NWD and Ken Fone, COE-NWW*
7. Lower Granite Dam Operations - *Doug Baus, COE-NWD and Ann Setter, COE-NWW*
 - a. LWG Adult Passage Counts and Ladder Temperature Hourly Data. [\[PDF\]](#) [\[Excel\]](#)
 - b. LWG Tailrace Photos - 9/4/13 11:00. [\[PDF\]](#)
8. Completion of [SOR 2013-3](#) - Bonneville Operations - *Doug Baus, COE-NWD*
9. Operations Review
 - a. Reservoirs. [PSMP News Release](#)
 - b. Fish
 - c. Water Quality
 - d. Power System
10. Other
 - a. Set agenda and date for next meeting - **September 18, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Thu 22-Aug	21:00	22:00	FPP Unit 2		Night Video	0	3	0	0	0	0	1	1	0	0
Thu 22-Aug	22:00	23:00	FPP Unit 2		Night Video	2	2	0	0	0	0	0	2	0	0
Thu 22-Aug	23:00	0:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	1	0	0
Fri 23-Aug	0:00	1:00	FPP Unit 2		Night Video	0	1	0	0	0	1	0	0	0	0
Fri 23-Aug	1:00	2:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	1	0	0
Fri 23-Aug	2:00	3:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Fri 23-Aug	3:00	4:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Fri 23-Aug	4:00	5:00	FPP Unit 2		Night Video	0	0	0	0	0	1	0	0	0	0
Fri 23-Aug					Sum Night	-4		0		-2		-4		0	
Fri 23-Aug	5:00	6:00	FPP Unit 2		Day	0	2	0	0	0	0	0	0	0	0
Fri 23-Aug	6:00	7:00	FPP Unit 2		Day	4	2	2	1	1	0	2	1	0	0
Fri 23-Aug	7:00	8:00	FPP Unit 2		Day	2	0	0	0	6	4	3	0	0	0
Fri 23-Aug	8:00	9:00	FPP Unit 2		Day	7	4	1	0	1	0	5	2	0	0
Fri 23-Aug	9:00	10:00	Station service + spill		Day	10	7	2	0	8	2	1	0	0	0
Fri 23-Aug	10:00	11:00	Station service + spill		Day	4	1	2	0	5	2	4	1	0	0
Fri 23-Aug	11:00	12:00	Station service + spill		Day	9	7	1	1	2	1	1	0	0	0
Fri 23-Aug	12:00	13:00	Station service + spill		Day	6	6	4	4	1	0	2	0	0	0
Fri 23-Aug					Sum 0500-1300	13		6		15		14		0	
Fri 23-Aug	13:00	14:00	Station service + spill		Day	7	3	1	0	0	2	4	0	0	0
Fri 23-Aug	14:00	15:00	Station service + spill		Day	2	2	1	0	1	0	4	0	0	0
Fri 23-Aug	15:00	16:00	Station service + spill		Day	8	4	0	0	1	0	2	0	0	0
Fri 23-Aug	16:00	17:00	Station service + spill		Day	11	1	1	0	0	0	1	2	0	0
Fri 23-Aug	17:00	18:00	Station service + spill		Day	8	4	1	0	3	0	1	0	0	0
Fri 23-Aug	18:00	19:00	Station service + spill		Day	6	3	1	1	2	0	4	0	0	0
Fri 23-Aug	19:00	20:00	Station service + spill		Day	3	6	0	0	3	0	0	0	0	0
Fri 23-Aug	20:00	21:00	Station service + spill		Day	0	7	1	0	0	0	0	0	0	0
Fri 23-Aug					Sum 1300-2100	15		5		8		14		0	
Fri 23-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			34		13		28		34		0	
Fri 23-Aug	21:00	22:00	Station service + spill		Night Video	1	1	0	0	0	0	0	1	0	0
Fri 23-Aug	22:00	23:00	FPP Unit 2		Night Video	0	0	0	0	0	1	0	1	0	0
Fri 23-Aug	23:00	0:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	0	0	0
Sat 24-Aug	0:00	1:00	FPP Unit 2		Night Video	0	0	0	0	0	0	1	0	0	0
Sat 24-Aug	1:00	2:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	1	0	0
Sat 24-Aug	2:00	3:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Sat 24-Aug	3:00	4:00	FPP Unit 2		Night Video	1	2	0	0	0	0	0	0	0	0
Sat 24-Aug	4:00	5:00	FPP Unit 2		Night Video	1	2	0	0	2	3	0	0	0	0
Sat 24-Aug					Sum Night	-6		0		-2		-2		0	
Sat 24-Aug	5:00	6:00	FPP Unit 2		Day	2	2	0	0	1	1	1	0	0	0
Sat 24-Aug	6:00	7:00	FPP Unit 2		Day	11	1	3	0	4	0	2	0	0	0
Sat 24-Aug	7:00	8:00	FPP Unit 2		Day	31	7	3	0	6	1	8	3	0	0
Sat 24-Aug	8:00	9:00	FPP Unit 2		Day	66	30	6	1	6	2	8	0	0	0
Sat 24-Aug	9:00	10:00	FPP Unit 2		Day	94	47	8	1	7	1	7	2	0	0
Sat 24-Aug	10:00	11:00	FPP Unit 2		Day	57	47	1	2	6	0	1	0	0	0
Sat 24-Aug	11:00	12:00	FPP Unit 2		Day	77	54	9	1	3	0	6	2	0	0
Sat 24-Aug	12:00	13:00	FPP Unit 2		Day	65	39	12	0	8	1	4	2	0	0
Sat 24-Aug					Sum 0500-1300	176		37		35		28		0	
Sat 24-Aug	13:00	14:00	FPP Unit 2		Day	40	33	4	0	3	0	10	1	0	0
Sat 24-Aug	14:00	15:00	FPP Unit 2		Day	49	17	8	1	14	1	8	0	0	0
Sat 24-Aug	15:00	16:00	FPP Unit 2		Day	27	14	8	1	4	1	6	0	0	0
Sat 24-Aug	16:00	17:00	FPP Unit 2		Day	26	15	4	2	7	0	4	0	0	0
Sat 24-Aug	17:00	18:00	FPP Unit 2		Day	27	8	8	3	7	0	10	1	0	0
Sat 24-Aug	18:00	19:00	FPP Unit 2		Day	18	20	1	1	8	0	3	0	0	0
Sat 24-Aug	19:00	20:00	FPP Unit 2		Day	9	20	0	2	4	0	1	0	0	0
Sat 24-Aug	20:00	21:00	FPP Unit 2		Day	0	3	0	0	1	0	1	0	0	0
Sat 24-Aug					Sum 1300-2100	66		23		46		41		0	
			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			290		72		97		83		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 24-Aug	21:00	22:00	FPP Unit 2		Night Video	0	7	0	0	0	1	1	0	0	
Sat 24-Aug	22:00	23:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	0	0	
Sat 24-Aug	23:00	0:00	FPP Unit 2		Night Video	4	4	0	0	0	0	0	0	0	
Sun 25-Aug	0:00	1:00	FPP Unit 2		Night Video	6	10	0	0	0	0	0	0	0	
Sun 25-Aug	1:00	2:00	FPP Unit 2		Night Video	1	3	0	0	0	0	0	1	0	
Sun 25-Aug	2:00	3:00	FPP Unit 2		Night Video	9	10	0	0	0	0	0	0	0	
Sun 25-Aug	3:00	4:00	FPP Unit 2		Night Video	6	7	0	0	0	0	2	1	0	
Sun 25-Aug	4:00	5:00	FPP Unit 2		Night Video	1	3	1	0	0	0	0	0	0	
Sun 25-Aug					Sum Night	-19		1		-1		1		0	
Sun 25-Aug	5:00	6:00	FPP Unit 2		Day	0	2	0	0	0	0	0	0	0	
Sun 25-Aug	6:00	7:00	FPP Unit 2		Day	6	9	3	0	5	0	6	0	0	
Sun 25-Aug	7:00	8:00	FPP Unit 2		Day	7	23	6	1	10	0	10	1	0	
Sun 25-Aug	8:00	9:00	FPP Unit 2		Day	15	5	3	0	4	0	4	0	0	
Sun 25-Aug	9:00	10:00	FPP Unit 2		Day	14	4	4	1	8	0	9	0	0	
Sun 25-Aug	10:00	11:00	FPP Unit 2		Day	14	5	2	0	10	0	8	0	0	
Sun 25-Aug	11:00	12:00	FPP Unit 2		Day	23	4	4	0	6	0	4	0	0	
Sun 25-Aug	12:00	13:00	FPP Unit 2		Day	16	5	4	2	7	0	10	0	0	
Sun 25-Aug					Sum 0500-1300	38		22		50		50		0	
Sun 25-Aug	13:00	14:00	FPP Unit 2		Day	21	8	2	2	7	0	5	0	0	
Sun 25-Aug	14:00	15:00	FPP Unit 2		Day	34	9	5	0	6	0	3	0	0	
Sun 25-Aug	15:00	16:00	FPP Unit 2		Day	37	6	2	1	9	0	4	0	0	
Sun 25-Aug	16:00	17:00	FPP Unit 2		Day	16	6	0	0	12	0	11	0	0	
Sun 25-Aug	17:00	18:00	FPP Unit 2		Day	9	13	1	1	6	1	4	0	0	
Sun 25-Aug	18:00	19:00	FPP Unit 2		Day	14	26	1	0	0	0	1	0	0	
Sun 25-Aug	19:00	20:00	FPP Unit 2		Day	0	6	0	2	1	1	1	0	0	
Sun 25-Aug	20:00	21:00	FPP Unit 2		Day	1	1	0	0	0	0	0	0	0	
Sun 25-Aug					Sum 1300-2100	57		5		39		29		0	
Sun 25-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			114		32		107		95		0	
Sun 25-Aug	21:00	22:00	FPP Unit 2		Night Video	0	2	0	0	1	0	0	0	0	0
Sun 25-Aug	22:00	23:00	FPP Unit 2		Night Video	0	1	0	0	0	0	1	0	0	0
Sun 25-Aug	23:00	0:00	FPP Unit 2		Night Video	1	0	0	0	0	0	0	0	0	0
Mon 26-Aug	0:00	1:00	FPP Unit 2		Night Video	0	0	1	0	0	0	0	0	0	0
Mon 26-Aug	1:00	2:00	FPP Unit 2		Night Video	1	0	0	0	0	0	0	0	0	0
Mon 26-Aug	2:00	3:00	FPP Unit 2		Night Video	0	1	0	0	0	0	1	0	0	0
Mon 26-Aug	3:00	4:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Mon 26-Aug	4:00	5:00	FPP Unit 2		Night Video	5	5	0	0	2	0	1	0	0	0
Mon 26-Aug					Sum Night	-2		1		3		3		0	
Mon 26-Aug	5:00	6:00	FPP Unit 2		Day	0	0	0	0	0	0	0	0	0	0
Mon 26-Aug	6:00	7:00	FPP Unit 2		Day	6	3	3	0	3	1	1	0	0	0
Mon 26-Aug	7:00	8:00	FPP Unit 2		Day	10	8	2	1	9	2	0	0	0	0
Mon 26-Aug	8:00	9:00	FPP Unit 2		Day	15	13	1	0	6	0	7	2	0	0
Mon 26-Aug	9:00	10:00	FPP Unit 2		Day	14	9	3	2	7	0	6	0	0	0
Mon 26-Aug	10:00	11:00	Station service + spill		Day	16	3	0	0	3	0	3	0	0	0
Mon 26-Aug	11:00	12:00	Station service + spill		Day	20	3	2	0	4	0	4	0	0	0
Mon 26-Aug	12:00	13:00	Station service + spill		Day	20	8	4	1	2	0	5	1	0	0
Mon 26-Aug					Sum 0500-1300	54		11		31		23		0	
Mon 26-Aug	13:00	14:00	Station service + spill		Day	10	7	1	0	3	1	4	0	0	0
Mon 26-Aug	14:00	15:00	Station service + spill		Day	12	9	1	1	0	0	4	0	0	0
Mon 26-Aug	15:00	16:00	Station service + spill		Day	10	5	2	0	0	0	6	1	0	0
Mon 26-Aug	16:00	17:00	Station service + spill		Day	18	2	0	0	3	0	6	0	0	0
Mon 26-Aug	17:00	18:00	Station service + spill		Day	7	3	2	0	0	0	4	0	0	0
Mon 26-Aug	18:00	19:00	Station service + spill		Day	5	1	3	2	1	0	2	0	0	0
Mon 26-Aug	19:00	20:00	Station service + spill		Day	1	4	1	1	1	0	1	0	0	0
Mon 26-Aug	20:00	21:00	Station service + spill		Day	0	4	0	0	0	0	1	0	0	0
Mon 26-Aug					Sum 1300-2100	28		6		7		27		0	
Mon 26-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			98		20		46		60		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Mon 26-Aug	21:00	22:00	Station service + spill		Night Video	2	5	0	0	0	0	0	0	0	0
Mon 26-Aug	22:00	23:00	Station service + spill		Night Video	1	0	0	1	0	0	0	0	0	0
Mon 26-Aug	23:00	0:00	FPP Unit 2		Night Video	1	2	0	1	0	0	0	0	0	0
Tue 27-Aug	0:00	1:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Tue 27-Aug	1:00	2:00	FPP Unit 2		Night Video	0	1	0	0	0	0	0	0	0	0
Tue 27-Aug	2:00	3:00	FPP Unit 2		Night Video	1	1	0	0	0	0	1	1	0	0
Tue 27-Aug	3:00	4:00	FPP Unit 2		Night Video	1	2	0	0	0	0	2	1	0	0
Tue 27-Aug	4:00	5:00	FPP Unit 2		Night Video	2	1	0	0	0	0	0	0	0	0
Tue 27-Aug					Sum Night	-4		-2		0		1		0	
Tue 27-Aug	5:00	6:00	FPP Unit 2		Day	0	0	0	0	1	0	0	0	0	0
Tue 27-Aug	6:00	7:00	FPP Unit 2		Day	13	6	5	1	2	0	2	0	0	0
Tue 27-Aug	7:00	8:00	FPP Unit 2		Day	22	13	7	0	7	0	9	0	1	0
Tue 27-Aug	8:00	9:00	FPP Unit 2		Day	15	5	1	3	6	0	4	0	0	0
Tue 27-Aug	9:00	10:00	FPP Unit 2		Day	20	8	3	0	13	1	4	0	0	0
Tue 27-Aug	10:00	11:00	Station service + spill		Day	54	5	10	0	11	1	5	0	0	0
Tue 27-Aug	11:00	12:00	Station service + spill		Day	43	15	5	1	10	0	8	0	0	0
Tue 27-Aug	12:00	13:00	Station service + spill		Day	38	29	9	3	4	0	5	0	0	0
Tue 27-Aug					Sum 0500-1300	124		32		52		37		1	
Tue 27-Aug	13:00	14:00	Station service + spill		Day	61	33	2	1	1	0	3	0	0	0
Tue 27-Aug	14:00	15:00	Station service + spill		Day	48	12	5	1	8	1	10	0	0	0
Tue 27-Aug	15:00	16:00	Station service + spill		Day	36	10	4	4	3	0	3	0	0	0
Tue 27-Aug	16:00	17:00	Station service + spill		Day	30	6	5	1	9	0	5	0	0	0
Tue 27-Aug	17:00	18:00	Station service + spill		Day	19	10	2	0	2	0	4	0	0	0
Tue 27-Aug	18:00	19:00	Station service + spill		Day	35	28	0	2	2	0	1	0	0	0
Tue 27-Aug	19:00	20:00	Station service + spill		Day	5	9	1	2	1	0	0	0	0	0
Tue 27-Aug	20:00	21:00	Station service + spill		Day	1	2	0	0	0	0	1	0	0	0
Tue 27-Aug					Sum 1300-2100	125		8		25		27		0	
Tue 27-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			299		48		92		77		1	
Tue 27-Aug	21:00	22:00	Station service + spill		Night Video	0	1	0	2	0	0	0	1	0	0
Tue 27-Aug	22:00	23:00	Station service + spill		Night Video	0	0	0	0	0	0	0	0	0	0
Tue 27-Aug	23:00	0:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Wed 28-Aug	0:00	1:00	FPP Unit 2		Night Video	1	1	0	0	1	0	0	0	0	0
Wed 28-Aug	1:00	2:00	FPP Unit 2		Night Video	6	7	0	0	0	0	0	0	0	0
Wed 28-Aug	2:00	3:00	FPP Unit 2		Night Video	1	2	0	0	0	0	0	0	0	0
Wed 28-Aug	3:00	4:00	FPP Unit 2		Night Video	2	3	0	0	0	0	0	0	0	0
Wed 28-Aug	4:00	5:00	FPP Unit 2		Night Video	1	1	0	0	3	1	2	0	0	0
Wed 28-Aug					Sum Night	-4		-2		3		1		0	
Wed 28-Aug	5:00	6:00	FPP Unit 2		Day	1	4	0	0	0	0	0	0	0	0
Wed 28-Aug	6:00	7:00	FPP Unit 2		Day	10	7	1	0	6	0	0	0	0	0
Wed 28-Aug	7:00	8:00	FPP Unit 2		Day	49	14	11	3	5	0	0	0	0	0
Wed 28-Aug	8:00	9:00	FPP Unit 2		Day	31	8	7	1	5	0	0	0	0	0
Wed 28-Aug	9:00	10:00	FPP Unit 2		Day	93	21	16	1	6	1	0	0	0	0
Wed 28-Aug	10:00	11:00	Station service + spill		Day	34	11	11	0	7	0	0	0	0	0
Wed 28-Aug	11:00	12:00	Station service + spill		Day	33	29	9	3	8	1	0	0	0	0
Wed 28-Aug	12:00	13:00	Station service + spill		Day	24	19	7	2	1	0	0	0	0	0
Wed 28-Aug					Sum 0500-1300	162		52		36		0		0	
Wed 28-Aug	13:00	14:00	Station service + spill		Day	37	30	2	1	10	0	5	1	0	0
Wed 28-Aug	14:00	15:00	Station service + spill		Day	23	10	3	2	9	1	8	0	0	0
Wed 28-Aug	15:00	16:00	Station service + spill		Day	8	10	5	0	3	1	5	0	0	0
Wed 28-Aug	16:00	17:00	Station service + spill		Day	11	12	4	1	2	0	3	0	0	0
Wed 28-Aug	17:00	18:00	Station service + spill		Day	4	6	1	1	5	0	11	0	0	0
Wed 28-Aug	18:00	19:00	Station service + spill		Day	2	2	0	0	2	0	1	0	0	0
Wed 28-Aug	19:00	20:00	Station service + spill		Day	1	4	0	0	0	0	0	0	0	0
Wed 28-Aug	20:00	21:00	Station service + spill		Day	0	2	0	0	0	0	2	0	0	0
Wed 28-Aug					Sum 1300-2100	10		10		29		34		0	
Wed 28-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			206		74		78		41		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Wed 28-Aug	21:00	22:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Wed 28-Aug	22:00	23:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	1	0	0
Wed 28-Aug	23:00	0:00	FPP Unit 2		Night Video	0	2	0	0	0	0	2	0	0	0
Thu 29-Aug	0:00	1:00	FPP Unit 2		Night Video	0	0	0	0	1	0	0	0	0	0
Thu 29-Aug	1:00	2:00	FPP Unit 2		Night Video	1	4	0	0	0	0	0	0	0	0
Thu 29-Aug	2:00	3:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	0	0	0
Thu 29-Aug	3:00	4:00	FPP Unit 2		Night Video	2	1	0	0	0	0	0	0	0	0
Thu 29-Aug	4:00	5:00	FPP Unit 2		Night Video	1	1	0	0	1	0	0	1	0	0
Thu 29-Aug					Sum Night	-6		0		2		0		0	
Thu 29-Aug	5:00	6:00	FPP Unit 2		Day	0	0	0	0	0	0	0	0	0	0
Thu 29-Aug	6:00	7:00	FPP Unit 2		Day	4	7	2	0	3	0	6	0	0	0
Thu 29-Aug	7:00	8:00	FPP Unit 2		Day	13	5	4	0	8	0	13	1	0	0
Thu 29-Aug	8:00	9:00	FPP Unit 2		Day	19	3	5	0	12	4	3	0	0	0
Thu 29-Aug	9:00	10:00	FPP Unit 2		Day	23	9	8	2	6	0	5	0	0	0
Thu 29-Aug	10:00	11:00	Station service + spill		Day	18	6	8	1	12	1	9	0	0	0
Thu 29-Aug	11:00	12:00	Station service + spill		Day	20	18	4	1	8	0	5	0	0	0
Thu 29-Aug	12:00	13:00	Station service + spill		Day	24	11	3	4	5	0	5	2	0	0
Thu 29-Aug					Sum 0500-1300	62		26		49		43		0	
Thu 29-Aug	13:00	14:00	Station service + spill		Day	30	6	7	1	2	0	1	0	0	0
Thu 29-Aug	14:00	15:00	Station service + spill		Day	45	19	3	2	7	1	4	0	0	0
Thu 29-Aug	15:00	16:00	Station service + spill		Day	23	5	2	1	1	0	5	0	0	0
Thu 29-Aug	16:00	17:00	Station service + spill		Day	24	9	4	1	3	0	3	0	0	0
Thu 29-Aug	17:00	18:00	Station service + spill		Day	25	17	1	0	3	0	2	0	0	0
Thu 29-Aug	18:00	19:00	Station service + spill		Day	18	10	1	0	3	0	2	0	0	0
Thu 29-Aug	19:00	20:00	Station service + spill		Day	5	1	1	1	3	0	1	0	0	0
Thu 29-Aug	20:00	21:00	FPP Unit 2		Day	2	3	0	0	0	0	0	0	0	0
Thu 29-Aug					Sum 1300-2100	102		13		21		18		0	
Thu 29-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			197		47		84		73		0	
Thu 29-Aug	21:00	22:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	0	0	0
Thu 29-Aug	22:00	23:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	0
Thu 29-Aug	23:00	0:00	FPP Unit 2		Night Video	1	1	0	0	0	0	1	0	0	0
Fri 30-Aug	0:00	1:00	FPP Unit 2		Night Video	1	2	0	1	0	0	0	0	0	0
Fri 30-Aug	1:00	2:00	FPP Unit 2		Night Video	1	0	0	0	1	0	0	0	0	0
Fri 30-Aug	2:00	3:00	FPP Unit 2		Night Video	0	1	2	1	0	0	0	1	0	0
Fri 30-Aug	3:00	4:00	FPP Unit 2		Night Video	0	1	4	2	0	0	0	2	0	0
Fri 30-Aug	4:00	5:00	FPP Unit 2		Night Video	1	4	0	0	0	0	0	0	0	0
Fri 30-Aug					Sum Night	-7		2		1		-2		0	
Fri 30-Aug	5:00	6:00	FPP Unit 2		Day	3	3	0	0	0	0	1	0	0	0
Fri 30-Aug	6:00	7:00	FPP Unit 2		Day	3	6	2	0	1	0	5	1	0	0
Fri 30-Aug	7:00	8:00	FPP Unit 2		Day	21	5	7	0	15	0	6	0	0	0
Fri 30-Aug	8:00	9:00	FPP Unit 2		Day	83	29	12	2	7	4	8	0	0	0
Fri 30-Aug	9:00	10:00	FPP Unit 2		Day	60	13	4	2	6	0	9	0	0	0
Fri 30-Aug	10:00	11:00	Station service + spill		Day	41	11	4	1	13	1	8	0	0	0
Fri 30-Aug	11:00	12:00	Station service + spill		Day	49	21	1	0	5	0	6	0	0	0
Fri 30-Aug	12:00	13:00	Station service + spill		Day	66	45	7	3	4	1	5	0	0	0
Fri 30-Aug					Sum 0500-1300	193		29		45		47		0	
Fri 30-Aug	13:00	14:00	Station service + spill		Day	42	29	4	0	8	1	8	1	0	0
Fri 30-Aug	14:00	15:00	Station service + spill		Day	50	14	2	1	12	2	7	0	0	0
Fri 30-Aug	15:00	16:00	Station service + spill		Day	32	12	18	3	7	0	1	0	0	0
Fri 30-Aug	16:00	17:00	Station service + spill		Day	26	15	5	3	2	0	6	2	0	0
Fri 30-Aug	17:00	18:00	Station service + spill		Day	30	16	5	2	4	0	4	0	0	0
Fri 30-Aug	18:00	19:00	Station service + spill		Day	7	11	2	0	3	0	2	0	0	0
Fri 30-Aug	19:00	20:00	Station service + spill		Day	3	7	1	1	2	1	3	0	0	0
Fri 30-Aug	20:00	21:00	Station service + spill		Day	3	3	0	0	0	0	2	0	0	0
Fri 30-Aug					Sum 1300-2100	86		27		34		30		0	
Fri 30-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			335		67		95		92		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Fri 30-Aug	21:00	22:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	0	0	
Fri 30-Aug	22:00	23:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	
Fri 30-Aug	23:00	0:00	FPP Unit 2		Night Video	0	0	1	0	0	0	0	1	0	
Sat 31-Aug	0:00	1:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	
Sat 31-Aug	1:00	2:00	FPP Unit 2		Night Video	1	0	2	0	0	0	0	0	0	
Sat 31-Aug	2:00	3:00	FPP Unit 2		Night Video	1	0	0	0	1	0	1	0	0	
Sat 31-Aug	3:00	4:00	FPP Unit 2		Night Video	0	4	2	1	0	0	0	0	0	
Sat 31-Aug	4:00	5:00	FPP Unit 2		Night Video	0	2	0	0	1	0	0	0	0	
Sat 31-Aug					Sum Night	-6		4		2		0		0	
Sat 31-Aug	5:00	6:00	FPP Unit 2		Day	1	1	0	0	2	0	0	0	0	
Sat 31-Aug	6:00	7:00	FPP Unit 2		Day	20	13	3	1	7	0	6	0	0	
Sat 31-Aug	7:00	8:00	FPP Unit 2		Day	19	2	2	0	9	0	6	0	0	
Sat 31-Aug	8:00	9:00	FPP Unit 2		Day	39	3	3	1	13	1	14	2	0	
Sat 31-Aug	9:00	10:00	FPP Unit 2		Day	29	6	2	0	4	0	10	1	0	
Sat 31-Aug	10:00	11:00	Station service + spill		Day	32	4	6	0	11	0	11	0	0	
Sat 31-Aug	11:00	12:00	Station service + spill		Day	35	18	6	1	11	0	5	2	0	
Sat 31-Aug	12:00	13:00	Station service + spill		Day	41	17	3	0	6	0	2	0	0	
Sat 31-Aug					Sum 0500-1300	152		22		62		49		0	
Sat 31-Aug	13:00	14:00	Station service + spill		Day	31	24	1	5	6	0	4	0	0	
Sat 31-Aug	14:00	15:00	Station service + spill		Day	25	15	3	2	13	1	4	0	0	
Sat 31-Aug	15:00	16:00	Station service + spill		Day	28	25	3	1	7	2	6	0	0	
Sat 31-Aug	16:00	17:00	Station service + spill		Day	15	15	1	0	6	4	5	0	0	
Sat 31-Aug	17:00	18:00	Station service + spill		Day	14	8	1	0	7	0	8	0	0	
Sat 31-Aug	18:00	19:00	Station service + spill		Day	11	16	2	0	6	3	6	0	0	
Sat 31-Aug	19:00	20:00	Station service + spill		Day	7	10	1	0	0	1	3	1	0	
Sat 31-Aug	20:00	21:00	Station service + spill		Day	1	4	0	0	0	0	0	1	0	
Sat 31-Aug					Sum 1300-2100	15		4		34		34		0	
Sat 31-Aug			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			200		31		115		100		0	
Sat 31-Aug	21:00	22:00	FPP Unit 2		Night Video	0	1	0	0	0	0	0	1	0	
Sat 31-Aug	22:00	23:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	
Sat 31-Aug	23:00	0:00	FPP Unit 2		Night Video	0	2	0	0	0	0	0	1	0	
Sun 01-Sep	0:00	1:00	FPP Unit 2		Night Video	0	0	0	0	0	0	0	0	0	
Sun 01-Sep	1:00	2:00	FPP Unit 2		Night Video	1	2	0	0	0	0	0	1	0	
Sun 01-Sep	2:00	3:00	FPP Unit 2		Night Video	1	0	0	0	1	0	1	0	0	
Sun 01-Sep	3:00	4:00	FPP Unit 2		Night Video	0	1	0	0	1	0	1	1	0	
Sun 01-Sep	4:00	5:00	FPP Unit 2		Night Video	3	3	1	0	2	1	0	0	0	
Sun 01-Sep					Sum Night	-4		1		3		-2		0	
Sun 01-Sep	5:00	6:00	FPP Unit 2 + 3		Day	1	2	1	1	1	0	1	0	0	
Sun 01-Sep	6:00	7:00	FPP Unit 2 + 3		Day	14	14	6	1	11	0	7	0	0	
Sun 01-Sep	7:00	8:00	FPP Unit 2 + 3		Day	174	28	25	1	20	0	21	1	0	
Sun 01-Sep	8:00	9:00	FPP Unit 2 + 3		Day	68	43	8	2	18	5	16	1	0	
Sun 01-Sep	9:00	10:00	FPP Unit 2 + 3		Day	59	33	4	2	20	4	13	6	0	
Sun 01-Sep	10:00	11:00	FPP Unit 2 + 3		Day	34	47	6	2	9	3	3	0	0	
Sun 01-Sep	11:00	12:00	FPP Unit 2 + 3		Day	123	84	22	6	7	0	10	1	0	
Sun 01-Sep	12:00	13:00	FPP Unit 2 + 3		Day	74	47	5	6	13	8	3	2	0	
Sun 01-Sep					Sum 0500-1300	249		56		79		63		0	
Sun 01-Sep	13:00	14:00	FPP Unit 2 + 3		Day	84	81	9	2	8	5	12	3	0	
Sun 01-Sep	14:00	15:00	FPP Unit 2 + 3		Day	114	36	27	8	8	0	9	1	0	
Sun 01-Sep	15:00	16:00	FPP Unit 2 + 3		Day	42	52	5	4	11	4	6	4	0	
Sun 01-Sep	16:00	17:00	FPP Unit 2 + 3		Day	49	82	9	16	10	9	4	5	0	
Sun 01-Sep	17:00	18:00	FPP Unit 2 + 3		Day	36	55	4	2	4	8	4	2	0	
Sun 01-Sep	18:00	19:00	FPP Unit 2 + 3		Day	14	24	2	2	2	1	5	0	0	
Sun 01-Sep	19:00	20:00	FPP Unit 2 + 3		Day	15	40	0	0	1	0	1	4	0	
Sun 01-Sep	20:00	21:00	FPP Unit 2 + 3		Day	2	3	0	1	1	0	2	0	0	
Sun 01-Sep					Sum 1300-2100	-17		21		18		24		0	
Sun 01-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			278		92		116		104		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sun 01-Sep	21:00	22:00	FPP Unit 2 + 3		Night Video										
Sun 01-Sep	22:00	23:00	FPP Unit 2 + 3		Night Video										
Sun 01-Sep	23:00	0:00	FPP Unit 2		Night Video										
Mon 02-Sep	0:00	1:00	FPP Unit 2		Night Video										
Mon 02-Sep	1:00	2:00	FPP Unit 2		Night Video										
Mon 02-Sep	2:00	3:00	FPP Unit 2		Night Video										
Mon 02-Sep	3:00	4:00	FPP Unit 2		Night Video										
Mon 02-Sep	4:00	5:00	FPP Unit 2		Night Video										
Mon 02-Sep					Sum Night										
Mon 02-Sep	5:00	6:00	FPP Unit 2		Day	0	1	0	0	0	0	0	0	0	0
Mon 02-Sep	6:00	7:00	FPP Unit 2 + 3		Day	3	13	1	0	3	2	1	0	0	0
Mon 02-Sep	7:00	8:00	FPP Unit 2 + 3		Day	17	8	2	1	6	1	4	0	0	0
Mon 02-Sep	8:00	9:00	FPP Unit 2 + 3		Day	42	16	8	1	10	1	8	2	0	0
Mon 02-Sep	9:00	10:00	FPP Unit 2 + 3		Day	43	14	8	0	9	1	13	0	0	0
Mon 02-Sep	10:00	11:00	FPP Unit 2 + 3		Day	69	42	14	2	9	5	3	0	0	0
Mon 02-Sep	11:00	12:00	FPP Unit 2 + 3		Day	81	51	12	6	4	3	3	2	0	0
Mon 02-Sep	12:00	13:00	FPP Unit 2 + 3		Day	54	27	15	1	8	0	8	0	0	0
Mon 02-Sep					Sum 0500-1300	137		49		36		36		0	
Mon 02-Sep	13:00	14:00	FPP Unit 2 + 3		Day	113	53	12	9	10	1	3	2	0	0
Mon 02-Sep	14:00	15:00	FPP Unit 2 + 3		Day	85	63	10	5	5	3	4	3	0	0
Mon 02-Sep	15:00	16:00	FPP Unit 2 + 3		Day	59	79	9	16	2	0	2	2	0	0
Mon 02-Sep	16:00	17:00	FPP Unit 2 + 3		Day	56	60	2	1	7	1	5	0	0	0
Mon 02-Sep	17:00	18:00	FPP Unit 2 + 3		Day	31	39	3	7	7	3	3	0	0	0
Mon 02-Sep	18:00	19:00	FPP Unit 2 + 3		Day	21	27	0	0	1	1	4	1	0	0
Mon 02-Sep	19:00	20:00	FPP Unit 2 + 3		Day	10	15	0	1	0	1	1	0	0	0
Mon 02-Sep	20:00	21:00	FPP Unit 2 + 3		Day	1	7	0	0	0	0	0	1	0	0
Mon 02-Sep					Sum 1300-2100	33		-3		22		13		0	
Mon 02-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			204		55		70		59		0	
Mon 02-Sep	21:00	22:00	FPP Unit 2 + 3		Night Video										
Mon 02-Sep	22:00	23:00	FPP Unit 2		Night Video										
Mon 02-Sep	23:00	0:00	FPP Unit 2		Night Video										
Tue 03-Sep	0:00	1:00	FPP Unit 2		Night Video										
Tue 03-Sep	1:00	2:00	FPP Unit 2		Night Video										
Tue 03-Sep	2:00	3:00	FPP Unit 2		Night Video										
Tue 03-Sep	3:00	4:00	FPP Unit 2		Night Video										
Tue 03-Sep	4:00	5:00	FPP Unit 2		Night Video										
Tue 03-Sep					Sum Night										
Tue 03-Sep	5:00	6:00	FPP Unit 2 + 3		Day	0	2	0	0	1	0	0	0	0	0
Tue 03-Sep	6:00	7:00	FPP Unit 2 + 3		Day	4	6	3	0	1	0	0	0	0	0
Tue 03-Sep	7:00	8:00	FPP Unit 2 + 3		Day	13	9	5	2	2	0	2	0	0	0
Tue 03-Sep	8:00	9:00	FPP Unit 2 + 3		Day	42	18	7	1	2	4	3	0	0	0
Tue 03-Sep	9:00	10:00	FPP Unit 2 + 3		Day	23	10	5	4	5	0	2	1	0	0
Tue 03-Sep	10:00	11:00	FPP Unit 2 + 3		Day	46	60	4	0	1	1	0	0	0	0
Tue 03-Sep	11:00	12:00	Station service + spill		Day	41	53	0	0	2	0	1	0	0	0
Tue 03-Sep	12:00	13:00	Station service + spill		Day	37	40	1	1	2	0	0	0	0	0
Tue 03-Sep					Sum 0500-1300	8		17		11		7		0	
Tue 03-Sep	13:00	14:00	Station service + spill		Day	32	32	0	0	2	0	1	0	0	0
Tue 03-Sep	14:00	15:00	Station service + spill		Day	57	62	0	0	1	2	0	0	0	0
Tue 03-Sep	15:00	16:00	Station service + spill		Day	38	41	0	0	2	0	1	0	0	0
Tue 03-Sep	16:00	17:00	Station service + spill		Day	42	43	0	0	2	0	1	0	0	0
Tue 03-Sep	17:00	18:00	Station service + spill		Day	40	40	0	0	1	0	1	1	0	0
Tue 03-Sep	18:00	19:00	Station service + spill		Day	32	35	1	0	0	0	0	1	0	0
Tue 03-Sep	19:00	20:00	Station service + spill		Day	8	8	0	0	3	1	0	0	0	0
Tue 03-Sep	20:00	21:00	Station service + spill		Day	0	1	0	0	0	0	2	1	0	0
Tue 03-Sep					Sum 1300-2100	-13		1		8		3		0	
Tue 03-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			-6		22		23		12		0	













COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

September 4, 2013

Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Review of Meeting Minutes

The group approved the August 21, 2013 Official Meeting Minutes, as well as the Facilitator's Notes. Final notes will be posted on the TMT website.

Treaty Fishing

Kyle Dittmer, CRITFC, reported that they are likely to submit a SOR for a fishing season beginning the week of September 9th and continuing into the following weeks. The Technical Advisory Committee (TAC) has recently downgraded the forecast for steelhead harvest. Up to this point, the fishing season has been successful, with steady pool elevations and no conflicts with nets. Tribal Fishing will remain on the Agenda for the coming weeks to update TMT on SORs.

Libby Operations

Joel Fenolio, COE, reported that the August elevations at Libby went according to plan and the targeted elevation of 2,449 feet was reached on August 31st. The pool has dropped below 2,449 feet in the beginning of September and the project is going to ramp down to 6kcfs by midnight tonight (9/4) and hold there for the remainder of September. The ramp down started on September 3rd, going from 8kcfs to 7kcfs; tonight they will decrease from 7kcfs to 6kcfs.

Brian Marotz, Montana Fish and Wildlife, made a request to the COE to hold the flows at 7kcfs for the first half of September in order to keep water on the riffles and assist with insect production for the growing season. Brian stated that this will help reduce the sag in the stage and manage the biological production into the winter. Joel Fenolio COE, reported that Libby does not have the flexibility to discharge over 6kcfs since the reservoir elevation is already below 2449 feet and due to a Cultural resources construction project underway at Alexander Creek; the project does not have in-water work permits and would be flooded at 7kcfs. There was inquiry as to if there are other remediation options to prevent watering at the construction at Alexander Creek, however, due to lack of in-water permits and the late request there are not. In response to questions raised about how this operation aligns or conflicts with the SOR submitted by the Kootenai Tribe, Joel said details on the SOR and planned operation can be found in the April 3, 2013 TMT meeting minutes, as well as in the June 18th Libby Operation presentation at which Joel outlined the September planned operation.

Jim Litchfield, Montana Fish and Game, informed TMT that per conversations with a Kootenai Tribe Attorney, the tribe supports dropping the flow to 6kcfs, as it will assist in their sturgeon habitat work. He also commended COE for their success in the August elevation operations and acknowledged that they do not have a lot of flexibility at this point.

Although the Cultural resources construction project will be completed this year, the sturgeon habitat work will continue for two more years. In order to coordinate multiple requests, COE asked that future

flow requests are made well in advance of implementation. Also, Brian asked that the COE be mindful of the desire to hold the pool a little higher in September to the extent possible to meet the biological need he described above.

Dworshak Temperature Control Operation

Steve Hall, COE, reported that the project hit the targeted elevation of 1,535 feet on August 31st and has been discharging 7.5kcfs since the end of August. Temperatures in the Lower Granite tailwater have been steady around 65°F +/- 0.5°, however, on September 3rd there was a brief temperature spike up to 67.25°F. This increase is thought to be from wind mixing the warm surface water layer down to a depth of 30 feet and bringing temperature as high as 70°F at a 30ft depth. Since the spike, the temperatures have decreased and should continue to do so with the transition into longer nights and cooler air temperatures.

Steve mentioned that the roof repair and warm weather has had an effect on temperatures this year; roof repair is planned to be completed on September 22nd. That said, the Dworshak operation has been successful in keeping Lower Granite tailwater temperatures within the criteria this year except for the recent spike. He also reported that the project is no longer running the temperature models and is on a prescribed operational plan as modeled for the Nez Perce Tribe's flow augmentation agreement.

Lower Monumental Dam Juvenile Transport

Doug Baus and Ken Fone COE, noted that as stated in the August 30th TMT email notification, the juvenile transportation operation shifted on August 30th, suspending every-other-day truck transport and operating in primary bypass mode to route all bypassed fish back to the river. The facility continued condition sampling every 3 days and found signs of Columnaris in 2 of the 15 fish sampled during a 4 hour sampling on September 2nd. As a result of the data gathered on the 2nd, FPAC recommended and the COE agreed to implement a modified every-other-day truck transport operation that alternates between 24 hours of collection for truck transport and 24 hours of full bypass. FPAC expressed that this approach limits risks across options.

Action: The Corps will implement the modified every-other-day truck transport operation and begin collecting fish this morning for truck transport tomorrow, September 5th, then switching to primary bypass for the following 24-hour period. This operation will continue for 2 weeks and will be revisited at the September 18th TMT meeting.

Lower Granite Dam Operations Adult Fish Passage Counts and Ladder Temperature

Doug Baus acknowledged recent FPAC concerns associated with low passage of adult fall Chinook at Lower Granite Dam. A total of 7,070 have passed Little Goose, however, only 2,613 have passed Lower Granite. He explained that continued roof repair (currently anticipated to be completed on September 22nd) and annual maintenance of Unit 1 (September 3rd to 27th) has limited options for changing water temperatures and potentially increasing fish passage at Lower Granite. The repairs on Unit 1 were originally scheduled to begin August 1st, however were postponed in order to implement the TMT-coordinated operation of Unit 1 priority to address adult Sockeye passage delay issues.

Greg Moody, COE, reported that the recent hot weather warmed the pool significantly and contributed to the decline in adult passage. Temperatures were measured on September 3rd as high as 73°F at the surface, 69-70°F at 30ft depth and remained around 69°F at 50ft. Weather forecasts call for precipitation for the next 5-7 days, however, a drastic change is not expected in the near term.

Paul Wagner, NOAA, inquired as to if continuing to operate the two auxiliary pumps in the ladder would help pull in cold water, Greg Moody responded that it is unlikely to help because the pumps pull from a depth of 30ft where the temps are still high due to recent mixing that occurred in the pool. Scott Bettin, BPA, questioned whether there was interest in raising the forebay pool to see if it would pull in more cold water; Steve Hall explained that 2/3 of the water coming into the forebay is warm water from the Anatone and Orifino, and that raising the pool wouldn't have much of an effect, if any, on water temperatures at depth. Ann Setter, COE, shared that they have issued a request to see if there are options to speed up the roof repairs. Tom Lorz, CRITFC, mentioned that unless the temperature issues are caused by both warm air and hydraulics, speeding up the roof repair will not help. He requested that COE post photos of Unit 2 and 3 when in operation today to help determine if hydraulics are a contributing factor.

As of yesterday (9/3), the operation was spilling the river and operating Unit 5 for station service (5 kcfs) during daylight hours and generating at night with Unit 2 from 2000 to 0500 and shifting to operating Units 2 and 3 from 0600 to 0930 when the outage begins for the roof repair work.

Due to the inability to operate Unit 1, both COE and FPAC suggest the operation of unit 2 and 3 during the morning hours prior to the start of roof repair work that starts around 9:30am.

Action: The project will operate two units (units 2 and 3) rather than only one unit (unit 2) in an effort to improve adult passage. It was noted that implementing this operation may result in exceedences of end of MOP operation (1-ft range of 735.0 – 736.0 FT as a soft constraint until September 22) that was previously coordinated at TMT. Greg Moody will send Doug Baus updated water temperature data and photos of tailrace hydraulic conditions during this morning's Unit 2 & 3 operation for posting on today's TMT agenda.

Note: Originally, the Lower Granite Fish Passage and Ladder Temperature operation came to TMT due to adult Sockeye passage issues and was transferred back to Project Operators, researchers and staff as of the August 21st TMT meeting. Doug noted that due to necessary response time, TMT continues to discuss the operation, although it is coordinated through FPOM.

SOR 2013-3 Bonneville PH 2 Operations

Doug Baus notified TMT that SOR 2013-3 regarding Bonneville powerhouse 2 (PH2) operations had an end date of August 31, consistent with the draft Fish Passage Plan change form. As such, effective today, the Corps will remove the constraint to operate PH2 units in the mid-range, consistent with the SOR and FPP change form. Tom Lorz, CRITFC, noted that they will continue to keep an eye on fish conditions and Paul Wagner, NOAA, noted that fish were looking good at this point, with little to no descaling or mortality.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects. Grand Coulee was at elevation 1,278.7ft and with a target elevation of 1,283ft or higher by September 30th. Grand Coulee outflows are 79.9 kcfs with inflows of 87.1 kcfs. Hungry Horse had a midnight elevation of 3,553.1ft, with 1.9kcfs outflows; they are targeting 3,550ft by the end of September using a steady or slowly receding discharge pattern. Current flows at Columbia Falls is 3.9kcfs, the minimum is 3.5kcfs.

Lisa Wright, COE, reported on projects. Libby had a midnight elevation of 2448.9ft, with 6.2kcfs inflows and 8kcfs outflows. Albeni Falls had an elevation of 2,062.2ft, with 6.6kcfs inflows and 9kcfs outflows. Dworshak was at elevation 1,532.7ft, with 0.6kcfs inflows and 7.6kcfs outflows. Lower Granite average inflows were 22.1 kcfs; McNary average inflows were 87.2kcfs; and Bonneville average inflows were 96.3kcfs.

Steve Hall provided an update on the Programmatic Sediment Plan at Lower Granite, stating that due to EIS and environmental review requirements, the ROD will not be signed in time for dredging to occur in the 2013/2014 in-water work window and will be delayed at least until the 2014-15 in-water work window. At this point, the next steps are to conduct the bathymetry surveys, which will be completed by October 15 and will then need internal review before releasing for broader distribution. After the internal review, the COE will have more information for TMT discussions regarding how to operate at Lower Granite next year. TMT will revisit this issue in November at which time the Corps will share the results of the surveys. An update on the dredging schedule will be provided to TMT as soon as it is available.

Fish – Paul Wagner, NOAA, reported on fish passage. Subyearling Chinook are decreasing with 1,000/day at Lower Granite; 600/day at Little Goose; 420/day at McNary; 400/day at Bonneville and 15 at Lower Monumental. The low counts at Lower Monumental reflect the low rate of sampling, as there were 500-900/day passing just prior to full bypass going into effect.

For Adults, Paul reported that fall Chinook counts were 224% of the 10-year average at Bonneville, with 260,000 passing. Jacks were 214% of the 10-year average, with 32,600 passing Bonneville. 12,200 fall Chinook have passed Ice Harbor, along with 200 jacks. For Steelhead, 187,000 total have passed Bonneville, which is 68% of the 10-year average; of those, the wild steelhead counts are at 93% of their 10-year average. Lamprey continue to wind down; 22,000 past Bonneville, 70% of 10-year average. So far, 205 Sockeye have been collected at the Redfish trap, which represents between 25-30% of the fish that have passed Lower Granite; considering the conditions faced, these numbers are good. These fish are still coming, however are past their peak.

Water quality – Nothing to report

Power system – Tony Norris, BPA, provided the 2013 seasonal flow averages: Lower Granite Dam = 27.4 kcfs and McNary Dam = 172 kcfs.

The next TMT meeting will be a face to face on September 18th from 9:00-12:00 at the normal meeting location in the Corps' Division Building.

Agenda topics will include:

- Lower Granite operation
- Lower Monumental operation

- Treaty fishing
- Operation review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

September 4, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, BOR Oregon, CRITFC, Montana, Washington, NOAA, Montana, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of Meeting Minutes for August 21

There were no comments today on these minutes or on the series of minutes regarding Lower Granite ladder and trap operations in July and early August. These minutes and notes will be considered final unless future concerns are raised.

3. Treaty Fishing

Kyle Dittmer, CRITFC, reported the tribes will most likely fish again next week. They expect to submit an SOR to the Action Agencies requesting special operations at Bonneville, The Dalles and John Day by tomorrow or shortly thereafter.

4. Libby Operations

Joel Fenolio, COE, reported that Libby operations have gone according to plan as coordinated at TMT on June 19. That plan called for Libby to release 8 kcfs in September until the reservoir reaches elevation 2449 feet, then ramp down to 6 kcfs releases. It had been formulated in response to the Kootenai Tribe's SOR for sturgeon habitat restoration, which was presented to TMT on April 3, 2013. As of August 31, Libby reservoir elevation was 2449.1 feet. The project held releases at 8 kcfs through the weekend, then dropped to 7 kcfs and will ramp down again to 6 kcfs tonight. Reservoir elevation is currently 2,448 feet. Releases of 6 kcfs will continue through the rest of September.

Brian Marotz, Montana, requested a modification to hold Libby outflows at 7 kcfs through the first couple weeks of September for the sake of optimal insect production downstream of Libby Dam. This will help to increase biological production during the last of the short growing season. Marotz said the ramp down to 6 kcfs took Montana by surprise. Fenolio replied that cultural construction work underway at Alexander Creek requires outflows no higher than 6 kcfs through September. Because the reservoir is already below elevation 2449 feet, there isn't much flexibility to keep outflows above 6 kcfs at this point. The cultural construction project is a one-time event. Plans could be

made next year to keep the elevation higher in September, but this year it's too late. TMT will revisit Libby operations as needed.

5, Dworshak Temperature Control Operation

Steve Hall, COE Walla Walla, reported that Dworshak met the end of August target elevation of 1,535 feet on August 31 at 0900 hours, and has maintained discharges at 7.5 kcfs since that time. The September 3 midnight reservoir elevation was 1531.3 feet, and targeting 1520 feet on approximately September 22 in accordance with the Nez Perce Agreement. The Lower Granite tailwater temperature, which has been around 65 degrees F, increased suddenly yesterday to 67.25 degrees F, probably as a result of wind mixing the stratified warm surface water down to depths where it passes through turbines and spillways. Temperatures have since dropped again. In terms of managing temperatures, Lower Granite operations will continue to be constrained by the roof repair until September 22.

Because Dworshak operation is now prescribed according to the Nez Perce plan, the COE has stopped doing daily temperature modeling. TMT will continue to monitor Dworshak operations as part of its regular operations review through this fall and winter.

6. Lower Monumental Dam Juvenile Transportation

On August 30, Baus recalled, the COE notified TMT that every other day truck transport at Lower Monumental was suspended and fish routed back to the river via the primary bypass due to increasing rates of mortality and columnaris, and that condition sampling would continue to occur every 3 days. The condition sample on Monday, September 2, collected 15 fish during the 4-hour sample, with 0 morts and 2 fish with signs of columnaris. Since then, FPAC has discussed the situation and recommended resuming every other day truck transport and instead alternate between 24 hours of collection for truck transport and 24 hours of full bypass, Paul Wagner, NOAA, said. FPAC expressed that this approach limits risks across options, According to the project biologist, staff are prepared to switch to fish collection as soon as they are notified. There was TMT agreement to implement this operation therefore the Corps will implement this operation today and begin collecting fish for transport tomorrow, September 5. TMT will review it at the next meeting on September 18.

7. Lower Granite Dam Operations

Lower Granite operations are being constrained by roof repairs through September 22, Baus said. The roof work typically requires daytime powerhouse outages (all spill) and nighttime generation. Yesterday's (9/3) operation for the 24-hour period was: 1) Unit 2 in the morning from 0100 to 0500 hours, 2) shifting to operating Units 2 and 3 from 0600 to 0930 hours when the outage began for the roof repair, 3) running Unit 5 at 5 kcfs for station service and spilling the remainder of inflow from 1000 to 2000 hours, 4) then shifting back to Unit 2 from 2100 to 2400 hours.

Unit 1 went out of service for previously scheduled annual maintenance on September 3 until September 27. FPAC members suggested Unit 1 was considered the only potential tool available to deal with a thermal block at Lower Granite, which is likely linked to the discrepancy in adult fall Chinook passage counts between Little Goose (7,070 fish to date) and Lower Granite (2,613 fish to date).

Ann Setter and Greg Moody, COE Walla Walla, reported on current conditions at Lower Granite. As Steve Hall mentioned earlier when describing Dworshak operations, temperatures in the Lower Granite tailwater spiked yesterday due to wind mixing. This could have contributed to lower numbers of fish passing Lower Granite Dam. Currently, the temperature in the adult ladder is around 71 degrees F, which is still warm, Moody reported. Hall said the surface temperature in Lower Granite pool has been 72-73 degrees F over the past few days but is cooling. Yesterday around noon, the temperature at 10 meters rose from 69.5 degrees F to more than 72 degrees F. At 15 meters, however, the temperature stayed constant at 69 degrees F. The ladder draws water from a 5 meter depth (around 15 feet), so it will take a while for the pool to cool down and lower temperatures in the ladder.

There was general agreement that Unit 1 was the last viable option for managing this situation. Erick Van Dyke, Oregon, asked whether the COE is still monitoring water temperatures, and Baus said he will post recent temperature data by COB today to today's TMT agenda. Scott Bettin, BPA, asked whether it would be possible to bring the cooler, deeper water into the ladder by raising the pool elevation. Not really, Hall replied, because two-thirds of the water coming into Lower Granite forebay isn't from Dworshak but from other warm locations such as Hells Canyon, which has been discharging 7-8.5 kcfs. Natural cooling will have more of an effect than raising the pool. Hall said he expects temperatures to drop soon to the 70 degrees F range.

Moving forward, Setter said the COE Walla Walla District recommends a two-unit operation (units 2 and 3) rather than a single-unit operation (unit 2) during the early morning hours when adult passage is highest, while continuing to run the auxiliary pumps to cool the ladder. The high water temperatures would probably preclude use of the trap even if the pumps were turned off, Moody noted.

Tom Lorz, CRITFC/Umatilla, said probably the best option is to run units 2 and 3 together in the morning and hope adults enter the ladder. He asked the COE to provide photographs of the hydraulics in Lower Granite tailrace resulting from the operation of units 2 and 3, which Moody will do. The COE will continue to monitor the situation at Lower Granite closely. TMT will revisit this issue at its next meeting September 18.

8. Completion of SOR 2013-3 – Bonneville Operations

Effective today, the COE will end the special operation of operating powerhouse 2 units within the middle of the 1% efficiency range (mid-range), Baus reported. The

special operation defined in SOR 2013-3 had an end date of August 31, consistent with the draft 2014 Fish Passage Plan (FPP) change form that was coordinated at FPOM. The Corps will be ending the operation effective today in order to minimize the number of operational constraints in light of scheduled maintenance and upcoming special operations. Lorz said CRITFC will continue to monitor fish condition at Bonneville. Wagner said the incidence of descaling and mortality has been zero, and fish condition has generally been excellent.

9. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3553.1 feet, discharging 1.9 kcfs with an end of September elevation target of 3550 feet. Grand Coulee is at elevation 1278.7 feet, after having reached its August 31 BiOp elevation target. The project is operating to a September 30 elevation target of 1283 feet for kokanee.

Libby is at elevation 2448.9 feet, with inflows of 6.2 kcfs and releases of 8 kcfs. Albeni Falls is at elevation 2062.2 feet, with inflows of 6.6 kcfs and releases of 9 kcfs. Dworshak is at elevation 1532.7 feet, with inflows of 0.6 kcfs and releases of 7.6 kcfs.

McNary daily average inflows are 87.2 kcfs. Bonneville daily average inflows are 96.3 kcfs. Lower Granite daily average inflows are 22.1 kcfs.

Hall gave an update on the Lower Granite Programmatic Sediment Management Plan (PSMP) and EIS to address navigation issues at the confluence of the Snake and Clearwater rivers. The ROD was originally intended to be signed this September in time to implement dredging in the 2013/14 in-water work window, but that will be delayed by EIS technical and environmental review issues. This means the next possible in-water work window for the proposed dredging will be in winter 2014-15. Hall will give TMT more specifics on the schedule in November, as well as results from bathymetric surveys and any other details on the COE's plans for managing sediment at Lower Granite during the coming passage season.

Tony Norris, BPA, reported that average seasonal flows at Lower Granite this summer were 27.4 kcfs; at McNary, 172 kcfs.

b. Fish. Adults: At Bonneville, fall Chinook counts are the big news this year, with 260,000 fish arriving to date, or 224% of the 10-year average, Wagner reported. It is not yet known whether that is the peak. Fall Chinook jack counts at Bonneville are 32,600 fish to date, which is 215% of the 10-year average. Steelhead passage, however, is a different story. The count of 187,000 to date is only 68% of the 10-year average. Wild steelhead are faring somewhat better with a count of 85,500 to date, or 93% of the 10-year average. Lamprey passage at Bonneville is 22,000 to date, or 70% of the 10-year average.

At Ice Harbor, 12,200 fall Chinook have passed to date, which is 300% of the 10-year average. The jack count is 2670, which is 200% of the 10-year average. As for sockeye, 205 were collected at Redfish Lake, which is 25-30% of the fish seen at Lower Granite, and they're still arriving.

Juveniles: Subyearling Chinook passage is declining but relatively strong for this time of year, with index counts of 1,000 fish per day each at Lower Granite and Little Goose, and 600 per day at Lower Monumental. Counts downriver are somewhat lower.

c. Water Quality. There was nothing to report.

d. Power System. There was nothing to report.

8. Next TMT Meeting

The next TMT meeting will be in person on September 18.

Name	Affiliation
Tony Norris	BPA
Doug Baus	COE
Scott Bettin	BPA
Lisa Wright	COE
Erick Van Dyke	Oregon
Tom Lorz	CRITFC Umatilla
Jim Litchfield	Montana
Charles Morrill	Washington
Paul Wagner	NOAA

Phone:	
Brian Marotz	Montana
Steve Hall	COE
Russ Kiefer	Idaho
Kyle Dittmer	CRITFC
Agnes Lut	BPA
Joel Fenolio	COE Seattle
Adam Price	COE Seattle
Ken Fone	COE Walla Walla
John Roache	BOR
Ann Setter	COE Walla Walla
Greg Moody	COE Walla Walla
Steve Hall	COE Walla Walla
Bill Proctor	COE NWD
Shane Scott	PPC

TECHNICAL MANAGEMENT TEAM

NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)		
BOR:	John Roache / Mary Mellema	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
COE:	Doug Baus / Karl Kanbergs		

TMT MEETING

Wednesday September 18, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 9041

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes - [September 4](#)
3. Treaty Fishing - Kyle Dittmer, CRITFC
4. Lower Granite Dam Operation - Doug Baus, COE-NWD
 - a. [Hourly Passage and Temperature Data](#)
 - b. [Forebay Temperature Forecast](#)
5. Lower Monumental Dam Juvenile Transportation - Doug Baus, COE-NWD
 - a. [Fish Condition Report](#)

6. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
7. Other
 - a. Set agenda and date for next meeting - **October 2, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

The following are LMN mortality rates and % of fish sampled with external symptoms of columnaris, starting Aug. 24 when fish first began showing signs of columnaris just before the second outbreak at the facility.

8/24 - 0.77% mortality (2 mortalities out of 216 fish collected),
sample columnaris rate of 1.70% (2 infected out of 116 sampled)

8/25 - 1.55% mortality (2 mortalities out of 129 fish collected),
sample columnaris rate of 23.2% (26 infected out of 112 sampled)

8/26 - 3.56% Mortality (9 mortalities out of 253 fish collected),
sample columnaris rate of 20.4% (22 infected out of 108 sampled)

8/27 - 14.43% Mortality (29 mortalities out of 201 fish collected),
sample columnaris rate of 14.7% (16 infected out of 109 sampled)

8/28 - 13.21% Mortality (60 mortality out of 507 fish collected),
sample columnaris rate of 16.0% (21 infected out of 131 sampled)

8/29 - 26.88% Mortality (111 mortality out of 413 fish collected),
sample columnaris rate of 22.6% (26 infected out of 115 sampled)

8/30 - 34.32% Mortality (93 mortality out of 271 fish collected),
sample columnaris rate of 25.4% (29 infected out of 114 sampled)

8/30 - switched to primary bypass

9/2 - 0% mortality (15 fish collected during 4-hour condition sample), no columnaris observed

9/4 - started alternate-day collection and transport / bypass

9/5 - 0% mortality (51 fish collected), no columnaris observed

9/7 - 0% mortality (37 fish collected), no columnaris observed

9/9 - 0% mortality (87 fish collected), no columnaris observed

9/11 - 0% mortality (163 fish collected),
sample columnaris rate of 3.33% (5 infected out of 150 fish sampled)

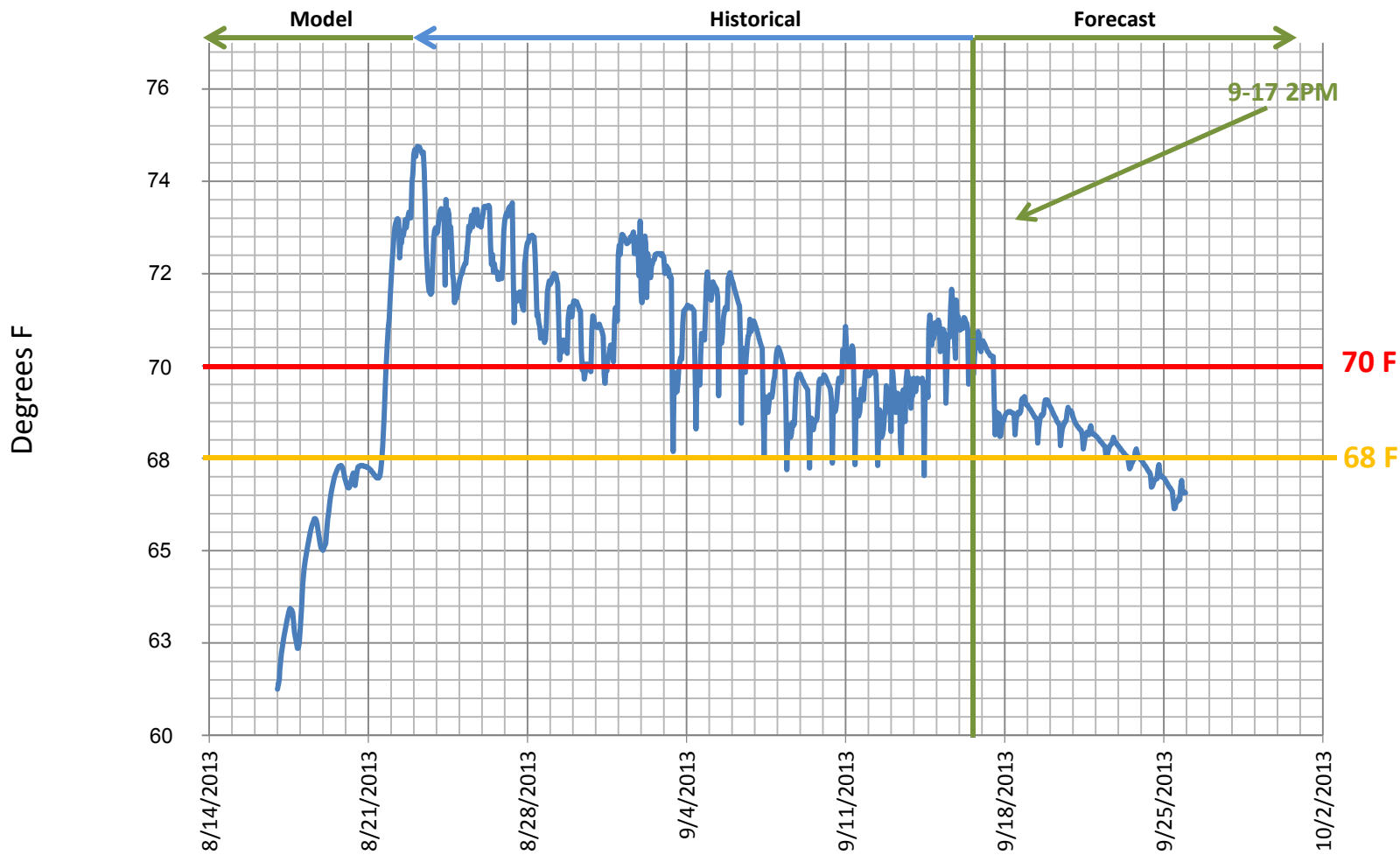
9/13 - 0.93% mortality (1 mortality out of 108 fish collected), no columnaris observed

9/15 - 0% mortality (53 fish collected), no columnaris observed

9/17 - 3.57% mortality (1 mortality out of 28 fish collected), no columnaris observed

Lower Granite Forebay at 5 Feet Constant Depth

Date From CEQUAL2E Model Derived from Chain Thermister at 5 Foot Increment



Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down		Chinook jack Up Down		Steelhead clipped Up Down		Steelhead wild Up Down		Sockeye Up Down	
Tue 03-Sep	21:00	22:00	FPP Unit 2	72.7	Night Video										
Tue 03-Sep	22:00	23:00	FPP Unit 2	72.7	Night Video										
Tue 03-Sep	23:00	0:00	FPP Unit 2	72.8	Night Video										
Wed 04-Sep	0:00	1:00	FPP Unit 2	72.8	Night Video										
Wed 04-Sep	1:00	2:00	FPP Unit 2	72.8	Night Video										
Wed 04-Sep	2:00	3:00	FPP Unit 2	72.8	Night Video										
Wed 04-Sep	3:00	4:00	FPP Unit 2	72.9	Night Video										
Wed 04-Sep	4:00	5:00	FPP Unit 2	72.9	Night Video										
Sum Night															
Wed 04-Sep	5:00	6:00	FPP Unit 2	72.8	Day	1	0	0	0	0	0	0	0	0	0
Wed 04-Sep	6:00	7:00	FPP Unit 2	72.2	Day	4	1	0	0	2	3	6	0	0	0
Wed 04-Sep	7:00	8:00	FPP Unit 2	71.9	Day	32	5	7	0	9	0	14	0	0	0
Wed 04-Sep	8:00	9:00	FPP Unit 2	72.1	Day	59	8	14	0	24	4	17	3	0	0
Wed 04-Sep	9:00	10:00	FPP Unit 2	72.6	Day	40	19	12	9	5	4	6	1	0	0
Wed 04-Sep	10:00	11:00	Station service + spill	72.1	Day	10	21	3	2	7	0	2	2	0	0
Wed 04-Sep	11:00	12:00	Station service + spill	72.7	Day	18	25	0	3	9	6	3	2	0	0
Wed 04-Sep	12:00	13:00	Station service + spill	72.4	Day	13	20	1	0	4	3	1	2	1	1
Sum 0500-1300						78		23		40		39		1	
Wed 04-Sep	13:00	14:00	Station service + spill	72.2	Day	16	16	3	0	2	0	3	0	0	0
Wed 04-Sep	14:00	15:00	Station service + spill	72.1	Day	14	12	4	1	2	0	5	0	0	0
Wed 04-Sep	15:00	16:00	Station service + spill	72.0	Day	33	30	5	1	5	2	3	0	0	0
Wed 04-Sep	16:00	17:00	Station service + spill	72.3	Day	5	9	0	1	2	1	4	2	0	0
Wed 04-Sep	17:00	18:00	Station service + spill	71.9	Day	1	2	1	2	3	1	1	0	0	0
Wed 04-Sep	18:00	19:00	Station service + spill	72.3	Day	1	3	2	0	4	2	0	1	0	0
Wed 04-Sep	19:00	20:00	Station service + spill	72.1	Day	3	8	0	1	0	0	0	0	0	0
Wed 04-Sep	20:00	21:00	Station service + spill	72.0	Day	0	2	1	2	0	0	0	0	0	0
Sum 1300-2100						-9		8		12		13		0	
Wed 04-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					83		37		62		62		1	
Wed 04-Sep	21:00	22:00	FPP Unit 2	72.7	Night Video										
Wed 04-Sep	22:00	23:00	FPP Unit 2	72.1	Night Video										
Wed 04-Sep	23:00	0:00	FPP Unit 2	72.0	Night Video										
Thu 05-Sep	0:00	1:00	FPP Unit 2	72.0	Night Video										
Thu 05-Sep	1:00	2:00	FPP Unit 2	72.1	Night Video										
Thu 05-Sep	2:00	3:00	FPP Unit 2	72.1	Night Video										
Thu 05-Sep	3:00	4:00	FPP Unit 2	72.1	Night Video										
Thu 05-Sep	4:00	5:00	FPP Unit 2	72.1	Night Video										
Sum Night															
Thu 05-Sep	5:00	6:00	FPP Unit 2 + 3	72.4	Day	1	0	0	0	0	0	1	0	0	0
Thu 05-Sep	6:00	7:00	FPP Unit 2 + 3	72.3	Day	10	1	4	0	6	1	4	0	0	0
Thu 05-Sep	7:00	8:00	FPP Unit 2 + 3	72.2	Day	320	13	23	4	20	2	23	4	0	0
Thu 05-Sep	8:00	9:00	FPP Unit 2 + 3	72.5	Day	215	88	30	17	19	2	16	1	0	0
Thu 05-Sep	9:00	10:00	FPP Unit 2 + 3	72.4	Day	167	114	20	12	7	5	8	7	0	0
Thu 05-Sep	10:00	11:00	Station service + spill	72.5	Day	45	136	6	7	3	2	1	3	0	0
Thu 05-Sep	11:00	12:00	Station service + spill	72.5	Day	42	125	3	8	3	1	1	1	0	0
Thu 05-Sep	12:00	13:00	Station service + spill	72.5	Day	27	67	3	8	0	1	1	0	0	0
Sum 0500-1300						283		33		44		39		0	
Thu 05-Sep	13:00	14:00	Station service + spill	72.8	Day	27	44	3	9	3	1	0	1	0	0
Thu 05-Sep	14:00	15:00	Station service + spill	72.6	Day	14	15	4	0	2	0	0	1	0	0
Thu 05-Sep	15:00	16:00	Station service + spill	72.7	Day	13	14	6	2	0	0	1	0	0	0
Thu 05-Sep	16:00	17:00	Station service + spill	72.9	Day	2	10	2	2	0	2	3	1	0	0
Thu 05-Sep	17:00	18:00	Station service + spill	72.9	Day	9	10	1	4	1	1	2	2	0	0
Thu 05-Sep	18:00	19:00	Station service + spill	73.0	Day	8	17	0	2	0	0	1	0	0	0
Thu 05-Sep	19:00	20:00	Station service + spill	73.1	Day	4	9	0	1	0	0	0	0	0	0
Thu 05-Sep	20:00	21:00	Station service + spill	73.0	Day	0	2	0	1	0	0	0	0	0	0
Sum 1300-2100						-44		-5		2		2		0	
Thu 05-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					287		34		55		49		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down		Chinook jack Up Down		Steelhead clipped Up Down		Steelhead wild Up Down		Sockeye Up Down	
Thu 05-Sep	21:00	22:00	FPP Unit 2 + 3	73.3	Night Video										
Thu 05-Sep	22:00	23:00	FPP Unit 2 + 3	72.6	Night Video										
Thu 05-Sep	23:00	0:00	FPP Unit 2 + 3	72.8	Night Video										
Fri 06-Sep	0:00	1:00	FPP Unit 2 + 3	72.9	Night Video										
Fri 06-Sep	1:00	2:00	FPP Unit 2 + 3	72.8	Night Video										
Fri 06-Sep	2:00	3:00	FPP Unit 2 + 3	72.8	Night Video										
Fri 06-Sep	3:00	4:00	FPP Unit 2 + 3	72.1	Night Video										
Fri 06-Sep	4:00	5:00	FPP Unit 2 + 3	72.1	Night Video										
Sum Night															
Fri 06-Sep	5:00	6:00	FPP Unit 2 + 3	72.7	Day	5	3	0	0	1	0	1	0	0	
Fri 06-Sep	6:00	7:00	FPP Unit 2 + 3	72.4	Day	18	6	6	0	7	0	6	0	0	
Fri 06-Sep	7:00	8:00	FPP Unit 2 + 3	72.5	Day	65	4	16	1	21	4	14	2	0	
Fri 06-Sep	8:00	9:00	FPP Unit 2 + 3	71.8	Day	65	6	17	0	8	2	8	0	0	
Fri 06-Sep	9:00	10:00	FPP Unit 2 + 3	71.7	Day	97	17	20	8	13	5	12	4	0	
Fri 06-Sep	10:00	11:00	Station service + spill	70.2	Day	22	19	3	2	7	0	4	1	0	
Fri 06-Sep	11:00	12:00	Station service + spill	71.1	Day	18	23	4	1	7	1	2	1	0	
Fri 06-Sep	12:00	13:00	Station service + spill	70.9	Day	20	27	2	2	5	1	5	3	0	
Sum 0500-1300						205		54		56		41		0	
Fri 06-Sep	13:00	14:00	Station service + spill	71.2	Day	32	29	10	8	3	1	2	0	0	
Fri 06-Sep	14:00	15:00	Station service + spill	70.9	Day	21	15	9	3	11	1	2	0	0	
Fri 06-Sep	15:00	16:00	Station service + spill	71.0	Day	3	8	1	3	7	2	4	2	0	
Fri 06-Sep	16:00	17:00	Station service + spill	70.7	Day	6	10	1	0	1	0	7	0	0	
Fri 06-Sep	17:00	18:00	Station service + spill	70.7	Day	10	8	1	1	6	1	4	0	0	
Fri 06-Sep	18:00	19:00	Station service + spill	70.8	Day	11	17	0	0	1	0	0	0	0	
Fri 06-Sep	19:00	20:00	Station service + spill	71.0	Day	1	8	0	0	0	0	1	0	0	
Fri 06-Sep	20:00	21:00	FPP Unit 2 + 3	70.9	Day	0	2	0	0	2	0	1	0	0	
Sum 1300-2100						-13		7		26		19		0	
Fri 06-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					230		73		98		72		0	
Fri 06-Sep	21:00	22:00	FPP Unit 2 + 3	71.1	Night Video										
Fri 06-Sep	22:00	23:00	FPP Unit 2 + 3	71.0	Night Video										
Fri 06-Sep	23:00	0:00	FPP Unit 2 + 3	71.2	Night Video										
Sat 07-Sep	0:00	1:00	FPP Unit 2 + 3	70.8	Night Video										
Sat 07-Sep	1:00	2:00	FPP Unit 2 + 3	70.6	Night Video										
Sat 07-Sep	2:00	3:00	FPP Unit 2 + 3	70.9	Night Video										
Sat 07-Sep	3:00	4:00	FPP Unit 2 + 3	70.7	Night Video										
Sat 07-Sep	4:00	5:00	FPP Unit 2 + 3	71.0	Night Video										
Sum Night															
Sat 07-Sep	5:00	6:00	FPP Unit 2 + 3	70.4	Day	2	1	0	0	1	0	2	1	0	
Sat 07-Sep	6:00	7:00	FPP Unit 2 + 3	70.8	Day	23	3	3	1	22	4	9	1	0	
Sat 07-Sep	7:00	8:00	FPP Unit 2 + 3	70.8	Day	116	6	33	0	22	3	15	2	0	
Sat 07-Sep	8:00	9:00	FPP Unit 2 + 3	70.9	Day	243	24	78	6	18	1	14	2	0	
Sat 07-Sep	9:00	10:00	FPP Unit 2 + 3	70.8	Day	189	22	68	5	16	0	14	1	0	
Sat 07-Sep	10:00	11:00	Station service + spill	69.5	Day	40	23	16	3	9	0	3	0	0	
Sat 07-Sep	11:00	12:00	Station service + spill	70.9	Day	20	31	10	7	11	4	5	2	0	
Sat 07-Sep	12:00	13:00	Station service + spill	70.3	Day	32	41	17	9	5	1	3	0	0	
Sum 0500-1300						514		194		91		56		0	
Sat 07-Sep	13:00	14:00	Station service + spill	70.5	Day	27	35	10	7	5	0	6	1	0	
Sat 07-Sep	14:00	15:00	Station service + spill	70.3	Day	18	28	6	2	3	0	6	0	0	
Sat 07-Sep	15:00	16:00	Station service + spill	70.2	Day	15	9	7	1	10	1	2	1	0	
Sat 07-Sep	16:00	17:00	Station service + spill	70.4	Day	2	5	1	4	3	1	2	0	0	
Sat 07-Sep	17:00	18:00	Station service + spill	70.2	Day	10	16	2	4	3	0	8	1	0	
Sat 07-Sep	18:00	19:00	Station service + spill	70.3	Day	3	8	2	1	4	0	1	0	0	
Sat 07-Sep	19:00	20:00	Station service + spill	70.1	Day	2	5	1	0	1	0	2	0	0	
Sat 07-Sep	20:00	21:00	Station service + spill	69.8	Day	0	4	0	0	0	0	0	0	0	
Sum 1300-2100						-33		10		27		24		0	
Sat 07-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					577		245		142		96		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Sat 07-Sep	21:00	22:00	Station service + spill	69.9	Night Video		1								
Sat 07-Sep	22:00	23:00	FPP Unit 2 + 3	70.1	Night Video		3								
Sat 07-Sep	23:00	0:00	FPP Unit 2 + 3	70.4	Night Video		1								
Sun 08-Sep	0:00	1:00	FPP Unit 2 + 3	70.3	Night Video	1	2		1	3		1			
Sun 08-Sep	1:00	2:00	FPP Unit 2 + 3	70.4	Night Video		1			3					
Sun 08-Sep	2:00	3:00	FPP Unit 2 + 3	70.4	Night Video	1	1			2		3			
Sun 08-Sep	3:00	4:00	FPP Unit 2 + 3	70.5	Night Video	2	2								
Sun 08-Sep	4:00	5:00	FPP Unit 2 + 3	70.4	Night Video	2	1					3			
Sum Night															
Sun 08-Sep	5:00	6:00	FPP Unit 2 + 3	70.4	Day	3	3	1	1	0	0	2	0	0	
Sun 08-Sep	6:00	7:00	FPP Unit 2 + 3	70.5	Day	17	3	6	0	8	0	7	0	0	
Sun 08-Sep	7:00	8:00	FPP Unit 2 + 3	70.5	Day	237	7	54	1	25	6	13	0	0	
Sun 08-Sep	8:00	9:00	FPP Unit 2 + 3	70.5	Day	203	13	52	2	24	3	17	0	0	
Sun 08-Sep	9:00	10:00	FPP Unit 2 + 3	70.5	Day	180	20	57	3	22	3	16	1	0	
Sun 08-Sep	10:00	11:00	Station service + spill	70.0	Day	25	11	4	0	10	1	10	0	0	
Sun 08-Sep	11:00	12:00	Station service + spill	70.4	Day	13	8	1	2	2	0	3	0	0	
Sun 08-Sep	12:00	13:00	Station service + spill	70.4	Day	12	15	0	0	9	2	4	0	0	
Sum 0500-1300						610		166		85		71		0	
Sun 08-Sep	13:00	14:00	Station service + spill	70.5	Day	10	6	3	0	11	1	6	1	0	
Sun 08-Sep	14:00	15:00	Station service + spill	70.2	Day	12	5	9	1	5	0	3	0	0	
Sun 08-Sep	15:00	16:00	Station service + spill	70.3	Day	7	6	2	1	8	2	7	3	0	
Sun 08-Sep	16:00	17:00	Station service + spill	70.2	Day	4	1	2	2	11	0	3	0	0	
Sun 08-Sep	17:00	18:00	Station service + spill	70.2	Day	2	5	1	1	10	2	0	0	0	
Sun 08-Sep	18:00	19:00	Station service + spill	70.2	Day	0	1	0	1	6	0	1	0	0	
Sun 08-Sep	19:00	20:00	Station service + spill	69.9	Day	1	0	1	0	3	0	1	0	0	
Sun 08-Sep	20:00	21:00	FPP Unit 2 + 3	69.8	Day	0	0	0	0	0	0	1	0	0	
Sum 1300-2100						12		12		49		18		0	
Sun 08-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					746		214		161		107		0	
Sun 08-Sep	21:00	22:00	FPP Unit 2 + 3	69.8	Night Video		3								
Sun 08-Sep	22:00	23:00	FPP Unit 2 + 3	69.8	Night Video							1			
Sun 08-Sep	23:00	0:00	FPP Unit 2 + 3	69.9	Night Video		1								
Mon 09-Sep	0:00	1:00	FPP Unit 2 + 3	69.9	Night Video	1	1	2	1						
Mon 09-Sep	1:00	2:00	FPP Unit 2 + 3	70.0	Night Video		1			1					
Mon 09-Sep	2:00	3:00	FPP Unit 2 + 3	69.9	Night Video	1	1			1	1	1			
Mon 09-Sep	3:00	4:00	FPP Unit 2 + 3	69.9	Night Video					1	1	2			
Mon 09-Sep	4:00	5:00	FPP Unit 2 + 3	69.9	Night Video		1								
Sum Night															
Mon 09-Sep	5:00	6:00	FPP Unit 2 + 3	70.0	Day	7	1	4	0	2	0	2	0	0	
Mon 09-Sep	6:00	7:00	FPP Unit 2 + 3	70.1	Day	68	3	15	1	13	1	18	0	0	
Mon 09-Sep	7:00	8:00	FPP Unit 2 + 3	70.3	Day	775	17	163	5	30	1	35	5	0	
Mon 09-Sep	8:00	9:00	FPP Unit 2 + 3	70.5	Day	794	30	159	9	40	0	19	2	0	
Mon 09-Sep	9:00	10:00	FPP Unit 2 + 3	70.5	Day	536	65	120	19	23	2	18	0	0	
Mon 09-Sep	10:00	11:00	Sta Serv + N. Spill	70.3	Day	45	49	9	8	5	1	2	0	0	
Mon 09-Sep	11:00	12:00	Sta Serv + N. Spill	70.5	Day	22	39	1	5	3	0	2	1	0	
Mon 09-Sep	12:00	13:00	Sta Serv + N. Spill	70.4	Day	46	64	3	2	1	0	2	0	0	
Sum 0500-1300						2,025		425		112		90		0	
Mon 09-Sep	13:00	14:00	Sta Serv + N. Spill	70.6	Day	6	21	3	1	0	0	0	0	0	
Mon 09-Sep	14:00	15:00	Sta Serv + N. Spill	70.4	Day	6	13	2	0	1	0	2	0	0	
Mon 09-Sep	15:00	16:00	Sta Serv + N. Spill	70.8	Day	2	13	1	0	0	0	0	0	0	
Mon 09-Sep	16:00	17:00	Sta Serv + N. Spill	71.5	Day	5	7	2	1	1	1	0	0	0	
Mon 09-Sep	17:00	18:00	Sta Serv + N. Spill	71.2	Day	3	8	0	0	1	0	1	0	0	
Mon 09-Sep	18:00	19:00	Sta Serv + N. Spill	71.2	Day	2	9	1	2	3	1	1	0	0	
Mon 09-Sep	19:00	20:00	Sta Serv + N. Spill	71.3	Day	5	13	0	1	1	0	0	0	0	
Mon 09-Sep	20:00	21:00	FPP Unit 2 + 3	71.3	Day	0	3	0	0	1	0	0	0	0	
Sum 1300-2100						-58		4		6		4		0	
Mon 09-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					2,360		515		142		113		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult		Chinook jack		Steelhead clipped		Steelhead wild		Sockeye	
						Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Mon 09-Sep	21:00	22:00	FPP Unit 2 + 3	71.7	Night Video										
Mon 09-Sep	22:00	23:00	FPP Unit 2 + 3	71.7	Night Video										
Mon 09-Sep	23:00	0:00	FPP Unit 2 + 3	71.5	Night Video										
Tue 10-Sep	0:00	1:00	FPP Unit 2 + 3	71.6	Night Video										
Tue 10-Sep	1:00	2:00	FPP Unit 2 + 3	71.4	Night Video										
Tue 10-Sep	2:00	3:00	FPP Unit 2 + 3	71.5	Night Video										
Tue 10-Sep	3:00	4:00	FPP Unit 2 + 3	71.3	Night Video										
Tue 10-Sep	4:00	5:00	FPP Unit 2 + 3	71.4	Night Video										
Sum Night															
Tue 10-Sep	5:00	6:00	FPP Unit 2 + 3	71.2	Day	2	2	0	0	2	0	2	0	0	0
Tue 10-Sep	6:00	7:00	FPP Unit 2 + 3	71.7	Day	4	2	0	2	9	1	5	0	0	0
Tue 10-Sep	7:00	8:00	FPP Unit 2 + 3	71.8	Day	78	13	11	4	19	1	7	0	0	0
Tue 10-Sep	8:00	9:00	FPP Unit 2 + 3	72.0	Day	58	15	5	2	13	0	4	1	0	0
Tue 10-Sep	9:00	10:00	FPP Unit 2 + 3	71.9	Day	31	18	9	5	14	1	8	1	0	0
Tue 10-Sep	10:00	11:00	Sta Serv + N. Spill	70.8	Day	8	9	1	1	6	1	2	0	0	0
Tue 10-Sep	11:00	12:00	Sta Serv + N. Spill	71.7	Day	3	2	1	1	3	1	1	0	0	0
Tue 10-Sep	12:00	13:00	Sta Serv + N. Spill	71.6	Day	20	25	1	0	1	1	1	0	0	0
Sum 0500-1300						118		13		61		28		0	
Tue 10-Sep	13:00	14:00	Sta Serv + N. Spill	72.2	Day	2	5	0	0	2	4	4	0	0	0
Tue 10-Sep	14:00	15:00	Sta Serv + N. Spill	72.2	Day	4	4	1	0	6	2	5	1	0	0
Tue 10-Sep	15:00	16:00	Sta Serv + N. Spill	71.6	Day	0	0	0	0	8	0	1	0	0	0
Tue 10-Sep	16:00	17:00	Sta Serv + N. Spill	71.8	Day	2	3	1	0	7	1	1	0	0	0
Tue 10-Sep	17:00	18:00	Sta Serv + N. Spill	71.7	Day	2	1	1	0	7	0	4	0	0	0
Tue 10-Sep	18:00	19:00	Sta Serv + N. Spill	72.0	Day	1	1	0	1	3	1	1	0	0	0
Tue 10-Sep	19:00	20:00	Sta Serv + N. Spill	72.1	Day	1	4	0	0	2	0	0	0	0	0
Tue 10-Sep	20:00	21:00	Sta Serv + N. Spill	71.9	Day	0	2	0	0	1	0	0	0	0	0
Sum 1300-2100						-8		2		28		15		0	
Tue 10-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					132		18		107		52		0	
Tue 10-Sep	21:00	22:00	FPP Unit 2 + 3	72.4	Night Video										
Tue 10-Sep	22:00	23:00	FPP Unit 2 + 3	72.3	Night Video										
Tue 10-Sep	23:00	0:00	FPP Unit 2 + 3	72.1	Night Video										
Wed 11-Sep	0:00	1:00	FPP Unit 2 + 3	72.0	Night Video										
Wed 11-Sep	1:00	2:00	FPP Unit 2 + 3	72.0	Night Video										
Wed 11-Sep	2:00	3:00	FPP Unit 2 + 3	72.0	Night Video										
Wed 11-Sep	3:00	4:00	FPP Unit 2 + 3	72.1	Night Video										
Wed 11-Sep	4:00	5:00	FPP Unit 2 + 3	72.1	Night Video										
Sum Night															
Wed 11-Sep	5:00	6:00	FPP Unit 2 + 3	72.1	Day	0	0	0	0	1	2	1	0	0	0
Wed 11-Sep	6:00	7:00	FPP Unit 2 + 3	72.1	Day	15	3	4	0	13	1	6	0	0	0
Wed 11-Sep	7:00	8:00	FPP Unit 2 + 3	71.9	Day	200	2	70	3	27	1	21	2	0	0
Wed 11-Sep	8:00	9:00	FPP Unit 2 + 3	72.1	Day	466	31	105	14	37	9	22	2	0	0
Wed 11-Sep	9:00	10:00	Sta Serv + N. Spill	72.3	Day	536	97	157	49	37	10	27	7	0	0
Wed 11-Sep	10:00	11:00	Sta Serv + N. Spill	72.0	Day	62	82	9	19	5	3	3	3	0	0
Wed 11-Sep	11:00	12:00	Sta Serv + N. Spill	72.3	Day	21	68	9	17	4	12	1	6	0	0
Wed 11-Sep	12:00	13:00	Sta Serv + N. Spill	72.3	Day	43	114	4	8	3	4	5	4	0	0
Sum 0500-1300						946		248		85		62		0	
Wed 11-Sep	13:00	14:00	Sta Serv + N. Spill	72.5	Day	19	43	4	4	1	0	4	2	0	0
Wed 11-Sep	14:00	15:00	Sta Serv + N. Spill	72.1	Day	13	33	2	3	5	0	3	0	0	0
Wed 11-Sep	15:00	16:00	Sta Serv + N. Spill	72.2	Day	14	22	11	10	8	2	3	0	0	0
Wed 11-Sep	16:00	17:00	Sta Serv + N. Spill	72.6	Day	15	13	1	3	4	1	2	0	0	0
Wed 11-Sep	17:00	18:00	Sta Serv + N. Spill	72.4	Day	8	12	2	4	7	1	2	0	0	0
Wed 11-Sep	18:00	19:00	Sta Serv + N. Spill	72.3	Day	11	18	2	1	2	0	1	0	0	0
Wed 11-Sep	19:00	20:00	Sta Serv + N. Spill	72.4	Day	2	14	2	2	4	0	0	0	0	0
Wed 11-Sep	20:00	21:00	Sta Serv + N. Spill	72.2	Day	0	7	0	1	1	0	2	0	0	0
Sum 1300-2100						-80		-4		28		15		0	
Wed 11-Sep	Day Total (FPC) = Sum 0500-2100 expanded by 1.2					1,039		293		136		92		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down		Chinook jack Up Down		Steelhead clipped Up Down		Steelhead wild Up Down		Sockeye Up Down	
Wed 11-Sep	21:00	22:00	FPP Unit 2 + 3	72.6	Night Video										
Wed 11-Sep	22:00	23:00	FPP Unit 2 + 3	72.1	Night Video										
Wed 11-Sep	23:00	0:00	FPP Unit 2 + 3	72.0	Night Video										
Thu 12-Sep	0:00	1:00	FPP Unit 2 + 3	72.3	Night Video										
Thu 12-Sep	1:00	2:00	FPP Unit 2 + 3	72.4	Night Video										
Thu 12-Sep	2:00	3:00	FPP Unit 2 + 3	72.4	Night Video										
Thu 12-Sep	3:00	4:00	FPP Unit 2 + 3	72.2	Night Video										
Thu 12-Sep	4:00	5:00	FPP Unit 2 + 3	72.0	Night Video										
Thu 12-Sep					Sum Night										
Thu 12-Sep	5:00	6:00	FPP Unit 2 + 3	72.1	Day	4	0	0	0	3	1	0	0	0	
Thu 12-Sep	6:00	7:00	FPP Unit 2 + 3	72.1	Day	62	8	24	1	11	1	12	0	0	
Thu 12-Sep	7:00	8:00	FPP Unit 2 + 3	72.1	Day	787	20	187	7	40	6	30	5	0	
Thu 12-Sep	8:00	9:00	FPP Unit 2 + 3	71.8	Day	1,127	110	243	20	48	5	32	0	0	
Thu 12-Sep	9:00	10:00	FPP Unit 2 + 3	71.7	Day	556	234	101	47	32	10	24	5	1	
Thu 12-Sep	10:00	11:00	Sta Serv + N. Spill	71.2	Day	181	238	28	24	12	6	8	7	0	
Thu 12-Sep	11:00	12:00	Sta Serv + N. Spill	71.6	Day	65	122	9	22	7	2	7	1	0	
Thu 12-Sep	12:00	13:00	Sta Serv + N. Spill	71.7	Day	73	143	25	42	5	3	5	1	0	
Thu 12-Sep			Sum 0500-1300			1,980		454		124		99		1	
Thu 12-Sep	13:00	14:00	Sta Serv + N. Spill	71.7	Day	34	56	13	8	8	2	7	0	0	
Thu 12-Sep	14:00	15:00	Sta Serv + N. Spill	71.5	Day	42	51	13	12	8	0	6	3	0	
Thu 12-Sep	15:00	16:00	Sta Serv + N. Spill	71.9	Day	39	31	16	7	7	1	2	0	0	
Thu 12-Sep	16:00	17:00	Sta Serv + N. Spill	71.7	Day	83	24	34	3	9	2	3	1	0	
Thu 12-Sep	17:00	18:00	Sta Serv + N. Spill	71.4	Day	66	35	12	7	6	1	5	0	0	1
Thu 12-Sep	18:00	19:00	Sta Serv + N. Spill	71.3	Day	22	34	3	6	9	1	3	0	0	
Thu 12-Sep	19:00	20:00	Sta Serv + N. Spill	71.4	Day	9	26	3	6	3	2	0	0	0	
Thu 12-Sep	20:00	21:00	FPP Unit 2 + 3	71.4	Day	1	6	0	2	1	1	1	0	0	
Thu 12-Sep			Sum 1300-2100			33		43		41		23		-1	
Thu 12-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			2,416		596		198		146		0	
Thu 12-Sep	21:00	22:00	FPP Unit 2 + 3	71.1	Night Video										
Thu 12-Sep	22:00	23:00	FPP Unit 2 + 3	71.2	Night Video										
Thu 12-Sep	23:00	0:00	FPP Unit 2 + 3	71.2	Night Video										
Fri 13-Sep	0:00	1:00	FPP Unit 2	71.3	Night Video										
Fri 13-Sep	1:00	2:00	FPP Unit 2	71.2	Night Video										
Fri 13-Sep	2:00	3:00	FPP Unit 2	71.0	Night Video										
Fri 13-Sep	3:00	4:00	FPP Unit 2	71.0	Night Video										
Fri 13-Sep	4:00	5:00	FPP Unit 2	70.9	Night Video										
Fri 13-Sep					Sum Night										
Fri 13-Sep	5:00	6:00	FPP Unit 2 + 3	70.8	Day	3	5	5	3	1	0	4	1	0	
Fri 13-Sep	6:00	7:00	FPP Unit 2 + 3	70.9	Day	37	23	24	6	8	1	11	3	0	
Fri 13-Sep	7:00	8:00	FPP Unit 2 + 3	71.1	Day	229	41	97	15	30	0	14	2	0	
Fri 13-Sep	8:00	9:00	FPP Unit 2 + 3	71.1	Day	889	82	345	30	49	3	20	0	0	
Fri 13-Sep	9:00	10:00	FPP Unit 2 + 3	71.1	Day	613	91	222	42	37	2	21	2	0	
Fri 13-Sep	10:00	11:00	Sta Serv + N. Spill	71.0	Day	126	72	53	19	15	0	13	2	0	
Fri 13-Sep	11:00	12:00	Sta Serv + N. Spill	70.6	Day	56	44	23	8	12	5	9	1	0	
Fri 13-Sep	12:00	13:00	Sta Serv + N. Spill	70.8	Day	73	65	12	9	7	2	2	1	0	
Fri 13-Sep			Sum 0500-1300			1,603		649		146		82		0	
Fri 13-Sep	13:00	14:00	Sta Serv + N. Spill	70.7	Day	32	36	12	5	6	1	4	1	0	
Fri 13-Sep	14:00	15:00	Sta Serv + N. Spill	70.8	Day	29	28	18	2	13	3	1	0	0	
Fri 13-Sep	15:00	16:00	Sta Serv + N. Spill	70.8	Day	22	14	8	5	12	1	5	1	0	
Fri 13-Sep	16:00	17:00	Sta Serv + N. Spill	70.6	Day	24	15	11	3	13	2	6	0	0	
Fri 13-Sep	17:00	18:00	Sta Serv + N. Spill	70.6	Day	35	21	12	2	13	0	13	4	0	
Fri 13-Sep	18:00	19:00	Sta Serv + N. Spill	70.3	Day	19	9	10	3	6	0	5	0	0	
Fri 13-Sep	19:00	20:00	Sta Serv + N. Spill	70.4	Day	1	11	1	2	7	0	3	1	0	
Fri 13-Sep	20:00	21:00	Unit 1	70.2	Day	1	2	0	3	0	1	0	0	0	
Fri 13-Sep			Sum 1300-2100			27		47		62		30		0	
Fri 13-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			1,956		835		250		134		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down		Chinook jack Up Down		Steelhead clipped Up Down		Steelhead wild Up Down		Sockeye Up Down	
Fri 13-Sep	21:00	22:00	Unit 1	70.9	Night Video										
Fri 13-Sep	22:00	23:00	Unit 1	70.4	Night Video										
Fri 13-Sep	23:00	0:00	Unit 1	70.6	Night Video										
Sat 14-Sep	0:00	1:00	Unit 1	70.7	Night Video										
Sat 14-Sep	1:00	2:00	Unit 1	70.6	Night Video										
Sat 14-Sep	2:00	3:00	Unit 1	70.5	Night Video										
Sat 14-Sep	3:00	4:00	Unit 1 + 2	70.5	Night Video										
Sat 14-Sep	4:00	5:00	Unit 1 + 2 + 3	70.6	Night Video										
					Sum Night										
Sat 14-Sep	5:00	6:00	Unit 1 + 2 + 3	70.6	Day	18	5	4	1	5	0	2	0	0	
Sat 14-Sep	6:00	7:00	Unit 1 + 2 + 3	70.6	Day	181	81	49	17	30	8	20	7	0	
Sat 14-Sep	7:00	8:00	Unit 1 + 2 + 3 + 4	70.5	Day	378	44	167	16	77	8	51	13	0	
Sat 14-Sep	8:00	9:00	Unit 1 + 2 + 3 + 4	70.8	Day	210	55	92	18	36	6	28	2	0	
Sat 14-Sep	9:00	10:00	Unit 1 + 2 + 3 + 4	70.7	Day	323	57	150	14	46	5	36	1	0	
Sat 14-Sep	10:00	11:00	Station Service only	69.7	Day	114	38	49	6	35	3	22	3	0	
Sat 14-Sep	11:00	12:00	Station Service only	70.6	Day	26	25	15	7	6	0	9	3	0	
Sat 14-Sep	12:00	13:00	Station Service only	71.1	Day	23	34	6	4	10	2	5	0	0	
			Sum 0500-1300			934		449		213		144		0	
Sat 14-Sep	13:00	14:00	Station Service only	71.2	Day	34	14	23	4	15	1	2	3	0	
Sat 14-Sep	14:00	15:00	Station Service only	71.1	Day	30	17	12	1	14	2	7	0	0	
Sat 14-Sep	15:00	16:00	Station Service only	71.3	Day	41	19	16	2	8	0	1	1	0	
Sat 14-Sep	16:00	17:00	Station Service only	71.4	Day	59	18	17	6	11	1	8	1	0	
Sat 14-Sep	17:00	18:00	Station Service only	71.4	Day	31	25	13	7	5	0	4	0	0	
Sat 14-Sep	18:00	19:00	Station Service only	71.6	Day	42	39	2	4	11	1	5	3	0	
Sat 14-Sep	19:00	20:00	Station Service only	71.6	Day	8	21	2	7	1	2	3	0	0	
Sat 14-Sep	20:00	21:00	Unit 1 + 2	71.9	Day	2	11	1	1	0	4	0	1	0	
Sat 14-Sep			Sum 1300-2100			83		54		54		21		0	
Sat 14-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			1,220		604		320		198		0	
Sat 14-Sep	21:00	22:00	Unit 1 + 2	72.8	Night Video										
Sat 14-Sep	22:00	23:00	Unit 1 + 2	72.6	Night Video										
Sat 14-Sep	23:00	0:00	Unit 1 + 2	72.2	Night Video										
Sun 15-Sep	0:00	1:00	Unit 1 + 2	72.4	Night Video										
Sun 15-Sep	1:00	2:00	Unit 1 + 2	72.2	Night Video										
Sun 15-Sep	2:00	3:00	Unit 1 + 2	71.6	Night Video										
Sun 15-Sep	3:00	4:00	Unit 1 + 2	71.7	Night Video										
Sun 15-Sep	4:00	5:00	Unit 1 + 2	71.4	Night Video										
Sun 15-Sep			Sum Night												
Sun 15-Sep	5:00	6:00	Unit 1 + 2	71.4	Day	0	3	1	0	0	0	0	0	0	
Sun 15-Sep	6:00	7:00	Unit 1 + 2	71.4	Day	5	16	3	4	3	1	0	0	0	
Sun 15-Sep	7:00	8:00	Unit 1 + 2	71.5	Day	64	26	27	4	2	2	2	0	0	
Sun 15-Sep	8:00	9:00	Unit 1 + 2	71.5	Day	138	21	40	5	7	1	5	0	0	
Sun 15-Sep	9:00	10:00	Unit 1 + 2	71.4	Day	84	12	29	2	11	1	7	0	0	
Sun 15-Sep	10:00	11:00	Station Service only	71.5	Day	23	20	15	9	6	0	2	0	0	
Sun 15-Sep	11:00	12:00	Station Service only	71.5	Day	4	9	6	3	7	0	4	1	0	
Sun 15-Sep	12:00	13:00	Station Service only	71.4	Day	17	12	14	5	10	0	5	0	0	
Sun 15-Sep			Sum 0500-1300			216		103		41		24		0	
Sun 15-Sep	13:00	14:00	Station Service only	71.5	Day	17	6	10	1	15	0	4	0	0	
Sun 15-Sep	14:00	15:00	Unit 1 + 2	71.7	Day	73	10	31	7	20	0	14	1	0	
Sun 15-Sep	15:00	16:00	Unit 1 + 2	71.8	Day	586	14	104	5	74	3	39	1	0	
Sun 15-Sep	16:00	17:00	Unit 1 + 2	71.7	Day	585	33	124	9	54	3	46	2	0	
Sun 15-Sep	17:00	18:00	Unit 1 + 2	72.4	Day	235	59	44	28	30	3	13	0	0	
Sun 15-Sep	18:00	19:00	Unit 1 + 2	72.4	Day	75	104	15	24	13	4	12	5	0	
Sun 15-Sep	19:00	20:00	Unit 1 + 2	72.5	Day	20	87	6	15	17	3	3	5	0	
Sun 15-Sep	20:00	21:00	Unit 1	72.7	Day	4	29	0	2	6	8	1	2	0	
Sun 15-Sep			Sum 1300-2100			1,253		243		205		116		0	
Sun 15-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			1,763		415		295		168		0	

Date	Start Time	End Time	Unit Priority	Ladder Exit Temp (°F)	Count Period	Chinook adult Up Down		Chinook jack Up Down		Steelhead clipped Up Down		Steelhead wild Up Down		Sockeye Up Down	
Sun 15-Sep	21:00	22:00	Unit 1	72.1	Night Video										
Sun 15-Sep	22:00	23:00	Unit 1	72.0	Night Video										
Sun 15-Sep	23:00	0:00	Unit 1	72.0	Night Video										
Mon 16-Sep	0:00	1:00	Unit 1	71.9	Night Video										
Mon 16-Sep	1:00	2:00	Unit 1	71.7	Night Video										
Mon 16-Sep	2:00	3:00	Unit 1	71.7	Night Video										
Mon 16-Sep	3:00	4:00	Unit 1	71.5	Night Video										
Mon 16-Sep	4:00	5:00	Unit 1	71.4	Night Video										
Mon 16-Sep					Sum Night										
Mon 16-Sep	5:00	6:00	Unit 1 + 2	71.4	Day	7	23	3	0	4	0	4	0		
Mon 16-Sep	6:00	7:00	Unit 1 + 2	71.4	Day	54	36	8	10	19	2	11	1		
Mon 16-Sep	7:00	8:00	Unit 1 + 2	71.4	Day	282	54	111	8	52	3	23	1		
Mon 16-Sep	8:00	9:00	Unit 1 + 2	71.5	Day	153	54	53	13	44	6	23	1		
Mon 16-Sep	9:00	10:00	Unit 1 + 2		Day	179	79	68	29	29	3	16	0		
Mon 16-Sep	10:00	11:00	Station Service only		Day	28	50	8	9	12	0	5	0		
Mon 16-Sep	11:00	12:00	Station Service only		Day	30	41	4	3	16	0	3	2		
Mon 16-Sep	12:00	13:00	Station Service only		Day	61	59	8	2	14	1	4	0		
Mon 16-Sep			Sum 0500-1300			398		189		175		84			
Mon 16-Sep	13:00	14:00	Station Service only		Day	16	26	7	1	7	1	0	0		
Mon 16-Sep	14:00	15:00	Station Service only		Day	45	21	9	0	5	0	3	1		
Mon 16-Sep	15:00	16:00	Station Service only		Day	23	8	13	5	14	0	7	0		
Mon 16-Sep	16:00	17:00	Station Service only		Day	20	17	6	5	8	0	4	0		
Mon 16-Sep	17:00	18:00	Station Service only		Day	34	11	8	2	8	0	4	0		
Mon 16-Sep	18:00	19:00	Station Service only		Day	11	7	3	5	9	0	0	0		
Mon 16-Sep	19:00	20:00	Station Service only		Day	2	8	0	0	2	0	5	2		
Mon 16-Sep	20:00	21:00	Station Service only		Day	3	7	1	0	0	0	0	0		
Mon 16-Sep			Sum 1300-2100			49		29		52		20			
Mon 16-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			536		262		272		125			
Mon 16-Sep	21:00	22:00	Unit 1		Night Video										
Mon 16-Sep	22:00	23:00	Unit 1		Night Video										
Mon 16-Sep	23:00	0:00	Unit 1		Night Video										
Tue 17-Sep	0:00	1:00	Unit 1		Night Video										
Tue 17-Sep	1:00	2:00	Unit 1		Night Video										
Tue 17-Sep	2:00	3:00	Unit 1		Night Video										
Tue 17-Sep	3:00	4:00	Unit 1		Night Video										
Tue 17-Sep	4:00	5:00	Unit 1		Night Video										
Tue 17-Sep					Sum Night										
Tue 17-Sep	5:00	6:00	Unit 1 + 2		Day	5	2	1	1	10	2	4	0		
Tue 17-Sep	6:00	7:00	Unit 1 + 2		Day	77	11	27	3	31	0	17	0		
Tue 17-Sep	7:00	8:00	Unit 1 + 2		Day	720	17	388	9	106	3	64	0		
Tue 17-Sep	8:00	9:00	Unit 1 + 2		Day	773	35	410	18	112	4	63	2		
Tue 17-Sep	9:00	10:00	Unit 1 + 2		Day	607	61	247	22	94	6	48	1		
Tue 17-Sep	10:00	11:00	Unit 1 + 2		Day	293	78	121	28	58	9	31	3		
Tue 17-Sep	11:00	12:00	Unit 1 + 2		Day	361	83	167	17	73	6	55	2		
Tue 17-Sep	12:00	13:00	Unit 1 + 2		Day	119	108	42	33	70	7	31	3		
Tue 17-Sep			Sum 0500-1300			2,560		1,272		517		302			
Tue 17-Sep	13:00	14:00	Unit 1		Day	79	87	32	29	58	6	26	2		
Tue 17-Sep	14:00	15:00	Unit 1		Day	338	89	91	17	116	11	44	4		
Tue 17-Sep	15:00	16:00	Unit 1		Day	82	55	19	15	112	10	38	1		
Tue 17-Sep	16:00	17:00	Unit 1		Day	62	40	31	21	50	6	24	1		
Tue 17-Sep	17:00	18:00	Unit 1		Day	72	42	15	6	56	5	21	2		
Tue 17-Sep	18:00	19:00	Unit 2		Day	10	25	3	1	18	5	5	0		
Tue 17-Sep	19:00	20:00	Unit 2		Day	4	8	2	1	8	3	5	0		
Tue 17-Sep	20:00	21:00	Unit 2		Day	0	6	0	1	0	3	0	1		
Tue 17-Sep			Sum 1300-2100			295		102		369		152			
Tue 17-Sep			Day Total (FPC) = Sum 0500-2100 expanded by 1.2			3,426		1,649		1,063		545			

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

September 18, 2013

Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Review of Meeting Minutes

The group approved the August 21, 2013 Official Meeting Minutes. The Facilitator's Notes will be edited to state that Jim Litchfield works for the State of Montana (not Fish and Game); pending this edit, the Facilitator's Notes were approved. Final notes will be posted on the TMT website.

Treaty Fishing

Doug Baus, Division Corps, reported that as of the last TMT meeting on September 4th, SOR 2013 C-7 was implemented; the SOR was for the Autumn treaty fishing season from September 10-14th. The SOR has been posted on the SOR page on the Corp's website. Tom Lorz, CRITFC/Umatilla, expressed appreciation on behalf of the tribes for the Corps' timely implementation efforts.

There was inquiry as to if the harvest numbers have been compiled at this point. Tom Lorz, CRITFC/Umatilla, reported that the official report with final allocation and harvest data will not be out until the end of the year, however, preliminary numbers will be available on the TAC website and updated as the season progresses.

Lower Granite Dam Operations

Doug Baus reported that inflows at Lower Granite are low. Yesterdays (9/17) day average outflows were 22 kcfs. Flows are forecasted to decrease to 19.5kcfs on the 20th, then drop to between 16-17.5kcfs on the 22nd and remain low. The current operation is a modified 2013 Fish Passage Plan (FPP) unit priority of 1, 2, 3, 4, 5, 6; with flows shaped to operate both Units 1 and 2 for higher discharge during morning hours to provide attraction to the fish ladder. Doug added that roof repair requires one more day of powerhouse outage for final inspection, but has been delayed due to rain. The final outage for the roof work is currently scheduled for Thursday 9/19 from 1200-1700 hours. Also, it was reported that adult passage numbers had picked up and yesterday's numbers were: 3,426 adult Fall Chinook; 1,649 jack fall Chinook; 1,068 clipped steelhead and over 500 wild steelhead. Fish passage occurred primarily during the earlier part of the day from 0500-1300.

To provide an operation that will best support adult fish passage during this period of extremely low Snake River flows, various unit priority options were discussed. The current operation is a modified unit priority order (1, 2, 3, 4, 5, 6) to prioritize Unit 1 to the extent possible and a daily two-unit operation (units 1 and 2) from 0500-1200 hours to provide increased attraction flow to the fish ladder during the critical morning hours of peak passage. From 1300-0500 hours, the project switches to Unit 2 priority as necessary to store water in the reservoir to provide the morning two-unit operation. Unit 2 has adjustable blades and can be operated at the lower end of the 1% range (lower discharge). The options discussed were:

- Continue the current modified unit priority (1, 2, 3, 4, 5, 6) and daily two-unit operation from 0500-1200. At 1300, if necessary due to low river flow, switch to unit 2 at a lower discharge and

store water in the reservoir to ensure sufficient water to operate units 1 and 2 the following morning.

- Or, run unit 1 during all hours as inflows allow. If inflows increase enough to operate two units, then add unit 2 during the peak morning hours. If flows decrease below ~18 kcfs that is required to run unit 1, switch to unit 2.

Doug Baus reported that inflows the night of 9/17 and morning of 9/18 were too low to operate unit 1 and so the project had to switch to unit 2 only.

Action/Planned Operation: The Salmon Managers expressed that their preference would be to run unit 1 as much as possible throughout the day, with a priority to run it in the morning peak passage hours. The Corps acknowledged that they heard the request and will incorporate the Salmon Managers recommendations to the extent possible with the available inflows.

Lower Monumental Dam Operation

Doug Baus explained that the low inflow issues are also affecting operations at Lower Monumental Dam. He recognized the Salmon Managers' preference to operate unit 1 to provide fish ladder attraction flow, however, noted that both low flows and operation and maintenance concerns are limiting the Corps' ability to run unit 1 (as described in the FPP). Additionally, unit 2 is out of service for annual maintenance. Thus, the current operation is running units 3 and 4.

It was noted that fish have been passing the project, however, it appeared they have been stacking below the project and then passing in large numbers. This stacking and passing pattern is not ideal. Russ Kiefer, Idaho, inquired as to if there have been any operational changes that could help explain the passage pattern, to which Ann Setter, Corps Walla Walla, replied that the operation has not changed but more likely it is due to weather and water temperature conditions. She noted that the passage conditions look good in the north ladder. Lisa Wright, Corps Division, confirmed that since September 11th Lower Monumental has been operating consistently with unit 3 priority, adding unit 4 in the afternoon hours when necessary to allow for increased inflows.

Operation and maintenance concerns for unit 1 were recognized as a limiting factor in the operation. Russ Kiefer, noted that today's challenges at Lower Monumental and Lower Granite reflect a larger challenge posed when the units are welded to a fixed blade angle that can only operate in the upper end of the 1% range and requires higher flows, limiting the ability to run these priority units during peak adult passage season when flows are lower. Ann Setter noted that some of the unit 1 maintenance issues at LMN will be addressed in Winter 2014, with a complete 'overhaul' slated for Summer 2015.

Salmon Managers recognized that due to low inflows and maintenance concerns, the Corps has limited operational flexibility at this point. They suggested that the Corps keeps the flow pattern as stable as possible and keep the flow as close to the ladder as possible. The AAs will continue to operate in accordance with the 2013 Fish Passage Plan unit priority (2, 3, 4, 5, 6, then 1). Specifically, based on current unit availability and anticipated river flow, the Corps will continue operation of unit 3 and add unit 4 when necessary, and will not operate unit 1 based on operations and maintenance concerns.

Lower Monumental Dam Juvenile Transport

Doug Baus noted that since the last TMT meeting on September 4th, a special operation has been implemented to transport juveniles from Lower Monumental Dam that alternates between 24 hours of collection for every-other-day truck transport and 24 hours of full bypass to return fish to the river.

Recent data from condition sampling shows little to no mortality and no signs of Columnaris, thus the Corps proposes to resume normal transport operations of collecting all fish for every-other-day truck transport. The Salmon Managers agreed that at this point it would be acceptable to return to normal transport operations.

Action: The Corps will discontinue the special operation and resume normal every-other-day transport. The project is collecting fish today, 9/18, for truck transport tomorrow, 9/19, and will continue collecting all fish for every-other day transport through the end of September.

Lower Granite Dam Operations Adult Fish Passage Counts and Ladder Temperature

Doug Baus reported that due to lower water temperatures in the forebay, the Corps proposes to shut off the auxiliary pumps in the fish ladder tomorrow, 9/19, at 2pm and monitor conditions in the adult trap for 24 hours, then reopen the trap if possible on 9/20 at 2pm. Steve Hall, Corps Walla Walla District, posted recent forebay temperatures on the TMT 9/18 Agenda and noted that the 9/17 temperatures decreased below 70°F and as of this morning temperatures in the forebay were down to 69.6°F. Today's temperatures corresponded well with the modeled temperatures; the model predicts that temperatures will continue to decrease. It was noted that the Nez Perce Tribe expressed at FPOM that they are eager to get the trap running as soon as possible, and today additional salmon managers concurred. The question was posed as to whether the Corps could shut off the pumps today so that the trap could be operated tomorrow if conditions were within established criteria. Based on observed conditions and staff availability, the Corps agreed that the pumps could be shut off as early as this afternoon.

Action: Auxiliary pumps will be shut off today (9/18) and temperatures will be monitored for 24 hours to ensure that trap operating criteria are met. The trap will be started as soon as possible following the temperature review. The trap is operated by NOAA, so Paul Wagner will coordinate with Darren Ogden to ensure that trap operators are ready to implement. If there are any major changes, Paul will contact TMT. *Follow up: Doug Baus forwarded an email to TMT on 9/19 indicating that NOAA would begin operating the adult trap on Monday (9/23) due to 'stressed condition of the fish at the moment, cooler temperatures on the horizon, and the presence of the project's maintenance staff on Monday to resolve potential problems during the first day's operation of the trap facility'.

Note: Lisa Wright posted hourly temperature and passage data through 9/17 on today's Agenda. TMT will follow-up on this operation during the next TMT meeting on October 2nd.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects. Hungry Horse had a midnight elevation of 3,551.5ft, with 1.9kcfs outflows. Based on current discharge and the inflow forecast, they are expecting to be close to the targeted 3,550 feet elevation by the end of the month, however, he noted some uncertainty with the inflow forecast. Grand Coulee was at elevation 1,281.3ft.

Lisa Wright, Corps, reported on projects. Libby had a midnight elevation of 2449.1ft, with 5.6kcfs inflows and 6kcfs outflows. Albeni Falls had an elevation of 2,061.8ft, with 8.2kcfs inflows and 13.4kcfs outflows. Dworshak was at elevation 1,520.8ft, with 0.7kcfs inflows and 2.4kcfs outflows. Lower Granite average inflows were 19.8kcfs; McNary average inflows were 107.1kcfs; and Bonneville average inflows were 119kcfs.

In accordance with the end of MOP operation previously coordinated at TMT the Snake Projects are expected to return to MOP on Friday, September 20th when the DWR forebay elevation reaches 1520.0 ft, as forecasted by Steve Hall, Corps Walla Walla. There was inquiry as to if there would be benefit in delaying the return to MOP in the Lower Snake River pools until the end of the month and allow for more flexibility to implement operations at Lower Monumental and Lower Granite. Tony Norris, BPA, responded that it will be best to return to MOP as scheduled, thus there will be no restrictions on the pool which will assist in system operations.

Fish – Paul Wagner, NOAA, reported on fish passage. For adults, Paul reported that fall Chinook counts were 238% of the 10-year average at Bonneville, with 717,488 passing. Jacks were 194% of the 10-year average, with 75,881 passing Bonneville. 37,424 fall Chinook have passed Ice Harbor, which is 265% of the 10-year average, along with 10,000 jacks, accounting for 200% of the 10-year average. For Steelhead, 211,648 total have passed Bonneville, with about 1,500/day, this represents 65% of the 10-year average. The wild steelhead counts are at 90% of their 10-year average, with 92,243 passing Bonneville. Steelhead at Ice Harbor are at 59% of the 10-year average, with 48,929 past; the wild steelhead numbers are at 68% of the 10-year average at Ice Harbor. Paul mentioned that the upriver trends look similar to trends downstream at Bonneville.

There was inquiry as to why there is a significant discrepancy in fall Chinook numbers between Bonneville and The Dalles Dam. Paul noted that it is likely in part due to harvest as well as fish taking advantage of the cold water refugia at the mouths of the Hood and White Salmon rivers.

For juveniles, Paul reported that the season is still approaching the end. Subyearling Chinook are decreasing with 1,500-2,000/day at Lower Granite; and similar counts at Little Goose. Lower Monumental is seeing less than 100 subyearlings pass each day, and counts at McNary are continuing to decrease. Counts at Bonneville are also nearing the end.

Water quality – Nothing to report.

Power system – Nothing to report.

The next TMT meeting will be a face to face on October 2nd from 9:00-12:00 at the normal meeting location in the Corps' Division Building.

Agenda topics will include:

- Treaty fishing
- Lake Pend Oreille/Albeni Falls 2014 Operations
- Update on Water Management Plan/Comment Period Schedule
- Update on Lower Granite Fish Ladder Adult Trap Operation
- Operations review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

September 18, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, Montana, BPA, BOR, Idaho, Colville Tribe, CRITFC/Umatilla Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review of September 4 Meeting Minutes

There were no comments today on the facilitator's notes or official minutes for September 4 except to clarify Montana's representation in the facilitator's notes. With that small change, the September 4 minutes and notes will be considered final unless future concerns are raised.

3. Treaty Fishing

Between the last TMT meeting and today, the COE implemented a treaty fishing SOR from September 10 through September 14, Baus reported. Tom Lorz, CRITFC/Umatilla, said he will provide harvest totals from that fishery to TMT members in the next few days. Until the harvest counts are finalized, people can track the catch data by contacting their TAC representative.

4. Lower Granite and Lower Monumental Unit Operations

Lower Granite: Baus said the common thread in operation of both lower Snake dams is managing low flows. The current concern at Lower Granite is maintaining the modified unit priority operation now in effect (units 1, 2, 3, 4, 5 and 6 in that order) as requested by the Salmon Managers. The AAs have been shaping discharges during the morning hours of 5 am to noon to increase attraction flows to the ladder.

The **Action Agencies** proposed to continue the modified unit priority, operating unit 1 from 5 am to noon and beyond that if possible, based on inflows. Because inflows are projected to drop, use of unit 1 around the clock isn't a likely option, Baus said. Unit 2, discharging 11.5 kcfs, would become the priority unit at 1 pm as flows allow. Yesterday's operation (unit 1 only, 18 kcfs, starting at 2 pm) was an anomaly because the roof repair, which will be completed by 5 pm tomorrow (1 day delay due to rain). There was no 5 kcfs speed no load in the late morning and early afternoon hours, so yesterday's operation is not an example of how the Action Agencies expect to move forward.

Daily average inflows at Lower Granite are in the 19 kcfs range and forecasted to drop as low as 17 kcfs over the weekend, Baus said. Yesterday's passage counts were 3426 adult chinook, 1649 jacks, 1063 clipped steelhead and 545 wild steelhead, Ann Setter, COE, said. Most of these fish passed the dam during the morning hours or from 2-3 pm.

Russ Kiefer said **Idaho** would like to see unit 1 operating 24/7 if possible. If inflows allow, add unit 2 to the morning operation to increase attraction. If inflows are insufficient to support unit 1 priority 24/7, switch to unit 2 in the mid afternoon when passage drops. According to this morning's data and forecasted conditions, inflows might not be sufficient to implement a request for continuous operation of unit 1, Baus replied. There was discussion of whether to pool the available water or spread it out over a 24 hour period.

Paul Wagner, **NOAA**, advised operating unit 1 until as late in the day as possible, then switching to unit 2 at 11.5 kcfs as needed to pool enough water to run unit 1 from 5 am until at least noon the next day. Kiefer pointed out that yesterday's operation went back and forth between operation of 2 units (1 and 2), therefore Kiefer would prefer to see maintaining unit 1 operation 24 hrs per day and operating unit 2 as flows allowed. That's only possible if inflows remain around 21 kcfs, Baus replied. Assuming inflows drop to 16.5 kcfs, every hour of running unit 2 instead of unit 1 means ponding 6 kcfs, Tony Norris, BPA, said. There was discussion of how to operate in order to store sufficient water for the 5 am-noon operation of unit 1 at 18 kcfs. The planning needs to happen more than an hour ahead of time, Norris noted.

There was agreement to operate unit 1 for as long as possible during the day, with a preference for 24/7 operation of unit 1 over a two-unit operation in the morning.

Lower Monumental: The same essential constraint – lack of water – exists at Lower Monumental, where the Salmon Managers have also requested use of unit 1. This unit is last-on, first-off because it has significant O&M issues associated with fixed blade welding, Baus explained. With unit 2 out of service, the COE recommends continuing the current operation of units 3 and 4 at Lower Monumental. Conditions appear to be good at the north ladder, Setter noted, and nothing in the passage data indicates adverse conditions. The overhaul of Lower Monumental unit 1 is scheduled for 2015; until then the COE prefers not to use the unit except during high flows in the spring.

Kiefer expressed concern that something is delaying fish at Lower Monumental Dam. Setter said weather and other environmental influences are most likely responsible for disparities in the day to day counts. Project operations have remained consistent over the past several days while adult passage numbers have varied, so there appears to be no connection between low passage days and project operations, Lisa Wright, COE, added.

Wagner clarified that the Salmon Managers' preference was to operate units in a manner that would increase attraction flow to the fish ladder in order to increase passage. However, there was general agreement that the current operation is the only operation possible under the circumstances. Kiefer said the current operation is acceptable, but long term questions remain about the use and repair of fixed blade units that had been specified as priority units for fish.

5. Lower Monumental Dam Juvenile Transportation

Since the last TMT meeting the COE has been operating Lower Monumental Dam at 24 hours of full bypass followed by 24 hours of fish collection for truck transport, Baus reported. On September 17, mortality was 3.6% and no columnaris among 28 fish. On September 15, there were no mortalities or columnaris among 53 fish. In light of these sampling results, the Action Agencies proposed to resume normal collection every day for truck transport every other day.

Wagner said NOAA doesn't have a strong feeling either way. If mortality and columnaris are low, it may be time to switch to normal FPP operation for the remainder of September. There was general agreement to revert to collecting daily for every other day truck transport beginning today.

Discussion turned to operation of the adult trap at Lower Granite. Due to elevated forebay temperatures, trap operations were suspended on July 15. Emergency auxiliary pumps were installed on July 25 to cool ladder temperatures but resulted in insufficient water depth at the trap for operations to resume. The auxiliary pumps are still operating at this time which precludes the ability to re-open the trap. Attached to this item on today's agenda are data on Lower Granite forebay temperatures. As of this morning, the forebay temperature is down to 69.6 degrees F, Steve Hall, COE, reported.

Setter said Nez Perce representatives have been urging the COE to get the trap up and operating as soon as possible. The COE therefore proposes to turn the auxiliary pumps off at 2 pm tomorrow and allow trap operations to resume. The Salmon Managers gave their feedback on this proposal.

- **NOAA** – Tomorrow is fine; today would be even better.
- **CRITFC** – Sooner is better than later.
- **Idaho** – Supports the effort to restart the trap as soon as possible.
- **Colville Tribe** – Supports the effort to restart the trap as soon as possible.

Wagner said he will double-check with NOAA staff that operate the trap to confirm when trap operations can be resumed. He will follow up with TMT on trap operations if necessary.

The COE plans to turn off the auxiliary pumps today and begin operation of the trap as soon as 2 pm tomorrow.

6. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3551.5 feet, discharging 1.9 kcfs. The end of September target is 3550 feet. Grand Coulee is at elevation 1281.3 feet.

Libby is at elevation 2449.1 feet, with inflows of 5.6 kcfs and releases of 6 kcfs. Albeni Falls is at elevation 2061.8 feet, with inflows of 8.2 kcfs and releases of 13.4 kcfs. Dworshak is at elevation 1520.8 feet, with inflows of 0.7 kcfs and releases of 2.4 kcfs, headed for an elevation of 1520 feet by September 20.

McNary daily average inflows are 107.1 kcfs. Bonneville daily average inflows are 119 kcfs. Lower Granite daily average inflows are 19.8 kcfs.

Norris reported that all of the Lower Snake pools will be returned to MOP range by sometime this Friday, September 20. The commitment to do this is tied to release of Dworshak augmentation volume. Kiefer expressed a preference for waiting until the end of the month to achieve MOP if the water is needed to allow operation of unit 1 at Lower Granite.

b. Fish. Adults: This has been a very good year for chinook, Wagner reported. At Bonneville, 717,488 chinook have passed to date, which is 238% of the 10 year average. The jack count is 75,881, which is 194% of the 10 year average. Steelhead passage is not so good at 211,648 to date, which is 65% of the 10 year average. Wild steelhead fared somewhat better at 92,243 fish, or 90% of the 10 year average.

At Ice Harbor, the fall chinook count is 37,424 to date, or 265% of the 10 year average. There are 10,000 fall chinook jacks, which is 200% of the 10 year average. The steelhead count is 48,929, which is 59% of the 10 year average (for wild steelhead, it's 68% of the 10 year average).

Juveniles: Smolt passage is nearly ended, having dropped to a few hundred fish per day over the past week at Bonneville. At Little Goose, counts are around 500 fish per day. Lamprey migration is also coming to an end.

c. Water Quality. There was nothing to report.

d. Power System. There was nothing to report.

8. Next TMT Meeting

The next TMT meeting will be in person on October 2. The agenda will include Lake Pend Oreille operations and the draft 2014 WMP.

Name	Affiliation
Paul Wagner	NOAA

Doug Baus	COE
Lisa Wright	COE
Jim Litchfield	Montana
Tony Norris	BPA
John Roache	BOR
Agnes Lut	BPA

Phone:

Russ Kiefer	Idaho
Scott Bettin	BPA
Sheri Sears	Colville
Tom Lorz	CRITFC/Umatilla
Steve Hall	COE
Heather Dohan	Puget
Ann Setter	COE
Barry Espenson	CBB
Bill Rudolph	NW Fish Letter
Don Tinker	SCL
Chris Pinney	COE
Greg Moody	COE

TECHNICAL MANAGEMENT TEAM

NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)		
BOR:	John Roache / Mary Mellema	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
COE:	Doug Baus / Karl Kanbergs		

TMT MEETING

Wednesday October 2, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 5284

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Meeting Minutes
3. Lake Pend Oreille Operations - Russ Kiefer - Idaho and Joel Fenolio - COE-NWS
4. Lower Granite Operations - Doug Baus - COE-NWD
5. Treaty Fishing - Kyle Dittmer - CRITFC
 - a. [SOR 2013 C-10](#)
6. Water Management Plan - Doug Baus - COE-NWD
7. Operations Review

- a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
8. Other
- a. Set agenda and date for next meeting - **October 16, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

October 2, 2013

Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Review of Minutes

The official TMT minutes for the September 18th meeting have not yet been posted on the TMT website; however, will be posted soon for review and finalization at the 10/16 meeting. The Facilitator's summary will also be finalized at that time.

Lake Pend Oreille Operations

The group discussed pool elevations at Lake Pend Oreille. Russ Kiefer, Idaho, reported that due to a lack of biological basis for a specific request, Idaho and USFWS would defer to the Action Agencies to implement the winter operation.

Action: The Action Agencies will operate the Lake Pend Oreille pool down to the winter target elevation of 2,051 by November 10th. During Kokanee spawning, the pool will be operated between 2,051 and 2,051.5ft; post-spawning elevations will be between 2,051 and 2,056ft. The winter operation is outlined on the COE Seattle District website.

Lower Granite Operations

COE reported that Lower Granite forebay water temperatures have decreased and compared to the report from the 9/18 TMT meeting, adult fish passage numbers have increased. The COE is interested in returning to normal FPP operations as soon as possible due to O&M concerns with Unit 1 operations and to support overall water management capabilities in the Snake River system. Tom Lorz, CRITFC/Umatilla, said he spoke with many of the Salmon Managers about this and they agreed to request that the Action Agencies delay returning to normal FPP operations at Lower Granite for another week, and instead keep operating with a prioritization for use of Unit 1. The Salmon Manager's interest is to limit potential risk of further delaying adult passage over the project. The Salmon Managers pointed to a system-wide slowdown of adult passage as a concern and hope to limit any potential action that could contribute to passage issues. It was recognized that the turbine operation at Lower Granite is likely not what is causing the current slowdown; however, Salmon Managers recommend a precautionary approach. The Action Agencies agreed to delay returning to normal FPP operations for a week, or until water conditions limited that operation of Unit 1, whichever comes first.

Action: Current Lower Granite operations, prioritizing Unit 1, will continue until 1700 on Wednesday, October 9th. However, if flows drop below what is needed to operate Unit 1, the project will switch to FPP priority of Units 2 and 3 and the project will manage for water management purposes. Operations will return to normal FPP operation (Table LWG-4) as of 1700 on 10/9/13.

Treaty Fishing

SOR 2013-10 is currently being implemented for treaty fishing from 9/30 to 10/3. Depending on run forecasts, which are scheduled to be discussed at the next TAC meeting, another SOR may be submitted in the coming weeks. CRITFC will alert COE of another SOR as soon as possible.

The fall Chinook run is strong, with close to 1 million passing Bonneville thus far. There are currently 377 nets in the water, with 153 (40%) in the Bonneville pool, 63 (17%) in The Dalles pool, and 161 (43%) in the John Day pool.

Water Management Plan

COE informed the group that as of October 1st, the draft 2014 Water Management Plan has been posted to the TMT website which also provided a schedule for drafts and edits. It was requested that TMT members download the document and submit edits in Track Changes. A schedule of draft releases and edit due dates can be found on the TMT website.

- TMT edits on the 1st draft are due by October 31st.
- Edits will be incorporated accordingly and another draft will be posted by the first week of November.
- TMT edits on the 2nd draft are due by November 15th.
- Edits will be incorporated accordingly the following draft will be posted on November 28th.
- The 2014 Seasonal Update draft will be posted to the TMT website by the end of November.
- The final 2014 Water Management Plan will be posted by the end of the year.

It was noted that there are no significant operational changes between the 2013 and 2014 Plans. Other changes in the documents mostly consist of operation descriptions. COE encouraged TMT members to look at the 2013 Seasonal Update, specifically the format, as the 2014 Water Management Plan will use a similar format. Also, the Seasonal Update provides a chronological summary of all operations.

Operation Review

Reservoirs – BOR reported on reservoir operations. Midnight elevations at Hungry Horse were 3,550.4ft, with 1.9kcfs discharge. There has been good precipitation and the project is going to hold outflows at 1.9kcfs until they hit 3,550ft, which is expected by early next week; at that point they will adjust to hit minimum flows below the project and at Columbia Falls. Grand Coulee midnight elevation was 1,285.2ft; the project is currently operating at 1,283ft or higher for resident fish.

COE reported on reservoir operations. Libby midnight elevation was at 2,450.1ft, with a discharge of 6kcfs and inflows of 9.6kcfs. The project will draw down in November; the minimum discharge for bull trout in October is 4kcfs, however, the project has flexibility to come up if needed. Midnight elevation at Albeni Falls was 2,060.2ft, with outflows of 21.1kcfs and inflows of 16.9kcfs. Dworshak midnight elevation was 1,520.7ft, with outflows of 1.6kcfs and inflows of 3kcfs. At Lower Granite inflows were 31.3kcfs; McNary inflows were 114.8kcfs and Bonneville inflows were 128.1kcfs.

Fish – Dan Feil, COE, reported that adult passage counts data will continue to be recorded, however, due to the Federal Government shutdown, posting of data will be challenging. It was recognized that count data is vital for TAC in setting harvest levels. Dan said it is likely that the raw data will be posted with a disclaimer stating that it has not yet been reviewed for quality control.

Tom Lorz reported that fall Chinook numbers have dipped, however, there may be another wave of passage coming. Similarly, adults in the Snake River system have dropped off and there will likely be

another run with significant numbers. On Thursday, September 26th, 12,000 adult fall Chinook passed Bonneville. Overall, it has been a record high year for fall Chinook.

Water Quality – Laura Hamilton, COE, reported that the water quality gauges are transitioning into the winter time arrangement. The Cascade Island gauge is out and will not be back online until the end of November. This gauge is periodically knocked out by heavy flows, thus, COE Portland District is looking into ways to reinforce the gauge. The Warrendale gauge is used for WQ monitoring and management during the Winter period, including for the chum operation, so a delay in repair to the Cascade Island given the Federal Government shutdown will not impact water quality management at Bonneville.

Laura added that due to the Government shutdown, USGS and USACE will not be able to maintain gauges in The Dalles, John Day and Bonneville if they are damaged. The Walla Walla district staff will repair gauges in the Snake system and McNary if necessary.

Power System – Nothing to report.

The next TMT meeting will be a face to face on October 16th from 9:00-12:00 at the normal meeting location in the Corps' Division Building.

Agenda topics will include:

- Treaty fishing
- Update on Lower Granite Operation
- Chum Update
- Operations review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

October 2, 2013
Minutes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, Washington, CRITFC/Umatilla, Idaho, BOR, BPA, Montana and others attended. There was no representation for NOAA Fisheries or USFWS today because both agencies are on furlough due to the government shutdown. This summary is an official record of the proceedings, not a verbatim transcript.

2. Lake Pend Oreille Operations

Neither IDFG or USFWS has a biological recommendation regarding Lake Pend Oreille operations this year, so they deferred to the Action Agencies for further decision-making, Russ Kiefer, Idaho, said. The current plan for the lake is to target 2051-2051.5 feet during kokanee spawning. Once spawning is complete, the operating range will be 2051-2056 feet for the lake, Tony Norris, BPA, said. The ramp-down will take place in stages, targeting elevation 2057 feet by mid-October, 2054 feet by the end of October, and 2051 feet by November 10. The COE has released a public announcement re: drafting the lake to 2051 feet by November 10. TMT will receive updates on Lake Pend Oreille operations as needed.

3. Lower Granite Operations

At the last TMT meeting September 18, when Lower Granite forebay temperatures were in the 70 degrees F range, TMT coordinated a temperature-control operation to prioritize use of Unit 1 through 5 pm today. At this time, with forebay temperatures down to approximately 64 degrees F, the Action Agencies proposed that normal FPP operations resume at Lower Granite. Adult passage counts at Lower Granite (48,799 cumulative total) are within 937 fish of the total that have passed Little Goose (49,736 cumulative total), which is significantly improved from earlier in the season when the discrepancy was in the range of 10,000 fish. Baus asked for TMT's comments on the proposed switch to FPP unit priority in the following order: unit 2, unit 3, then units 4-6 in any order, and finally unit 1 because its fixed-blade status makes adjustments for flow management difficult and there are concerns of wear and tear on the unit from starts and stops when not operating continuously.

Norris asked how continued use of Unit 1 would benefit adult passage now that forebay temperatures are lower and much more evenly distributed throughout the water column. Considering the sockeye losses we've had this year, as well as minimizing the potential for adverse impacts on fall Chinook, Tom Lorz, CRITFC/Umatilla, said he's risk-averse in protecting what remains of the largest fall Chinook run seen in recent

history. Something is clearly slowing adult passage recently at all projects on the Snake, with significant numbers of fish still passing. For the past 3 days, adult passage at all Snake projects has been low, which could be due to increased turbidity in the system from the recent high rain events.

Scott Bettin, BPA, said when flows drop below 30 kcfs, it's difficult to manage flows at Lower Granite with just unit 1 in service. Running units 2 and 3, rather than turning unit 1 on and off, would minimize the sudden change from 18 kcfs with Unit 1 to 30 kcfs with Units 1 and 2.

Russ Kiefer, Idaho, said the latest STP forecast indicates that flows at Lower Granite are expected to remain above 30 kcfs through October 12. Thus, flows in the river system should be adequate to accommodate Lorz's request to continue using Unit 1 as the priority unit for another week to make sure to move more adults. Kiefer recommended waiting a week to switch to unit 2 and 3 as the priority units at Lower Granite as described in the Fish Passage Plan. Norris asked for a clear biological justification for the request. Unit 1 provides the best attraction flows to the adult ladder, Kiefer replied. It appears that flows are sufficient to continue the operation for another week without significant risk to operations, so it would be prudent to use Unit 1 to provide the best possible passage conditions.

The Action Agencies proposed that the Unit 1 priority operation continue until flows drop below 30 kcfs or by 5 pm next Wednesday, whichever comes first. If unit 1 has to be turned off to manage flows, it will remain off and the operation will revert to FPP priority, units 2 and 3. TMT members present agreed to this operation.

Washington expressed appreciation for the Action Agencies' willingness to extend the use of Unit 1 with record numbers of fish passing this year.

4. Treaty Fishing – SOR 2013 C-10

Kyle Dittmer, CRITFC, presented SOR 2013-C10, which requests 1.5 foot operating bands for the three lower Columbia pools at The Dalles, John Day and Bonneville, from Monday, September 30, through Thursday, October 3. There is about a 50-50 chance of an additional week of fishing. The latest CRITFC net flight found 377 nets in the pools, with 206 of those on the Oregon side and 171 on the Washington side. Of these, 153 nets (40% of total) are at Bonneville, 63 nets (17% of total) are at The Dalles, and 161 (43% of total) are at John Day.

The TAC will wait for all catch data from last week before making an informed decision about any fishing beyond October 3. TMT will revisit treaty fishing as needed.

5. Water Management Plan Update

The draft 2014 WMP is posed to the TMT site for comments, Baus reported. TMT members were invited to download the Word document and comment on it in track

changes. Comments on the first draft are due October 31. The second draft of the WMP will be posted by the end of November, with comments due by November 15. The final 2014 WMP will be posted by the end of the year.

Baus noted that the first seasonal update to the 2014 WMP is essentially blank because the clock started on it October 1. However, TMT members were encouraged to review the 2013 final seasonal update because the 2014 version will be very similar.

6. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3550.4 feet, with 1.9 kcfs releases. The reservoir ended September at 3550.4 feet. The plan is to hold 1.9 kcfs releases until the reservoir hits 3550 feet elevation, which will probably be by this weekend or early next week. At that time, the project will drop to Columbia Falls and project minimums. Grand Coulee is at elevation 1285.2 feet, with an operating range objective of 1283 feet or higher for resident fisheries. The reservoir is expected to remain above 1283 feet until mid-November.

Libby is at elevation 2450.1 feet with average inflows of 9.6 kcfs and releases of 6 kcfs. Albeni Falls is at elevation 2060.2 feet with average inflows of 16.9 kcfs and releases of 21.1 kcfs. Dworshak is at elevation 1520.7 feet with average inflows of 3 kcfs and outflows of 1.6 kcfs.

Lower Granite daily average inflows are 31.3 kcfs. McNary daily average inflows are 114.8 kcfs. Bonneville daily average inflows are 128.1 kcfs. Jim Litchfield, Montana, asked whether the government furlough would impact scheduled repairs of the lamprey passage structure at Bonneville. The contract for that work has already been let, and work is set to proceed unless the furlough continues and impacts the availability of Corps project personnel to accommodate the repair work, Lisa Wright, COE, replied.

b. Fish. There was no official fish report today because Paul Wagner, NOAA Fisheries, was on furlough. Juvenile passage is nearly finished, Lorz reported, and adult fall Chinook passage dropped off faster than usual. There are more adults still moving up the Snake. TMT will revisit fish passage numbers at its next meeting October 16.

With regard to chum spawning season, Charles Morrill, Washington, will keep TMT informed on whether the recent surge in precipitation will give chum the signal to move upriver and begin spawning early this year.

c. Water Quality. Throughout the region, TDG gages are transitioning to winter operations, with tailwater gages running and forebay gages disconnected, Laura Hamilton, COE, reported. The Cascade Island gage below Bonneville Dam went out of service on August 29. For the past few years, the COE has been investigating ways of making this gage durable enough to withstand flows at its current location. The Warrandale gage is still functioning below Bonneville so the loss of Cascade Island will not impact the chum operation because the Corps operates to the Warrandale readings.

Hamilton reported that USGS staff who normally maintain the gages in the Portland district are on furlough, which means the gages at The Dalles, John Day and Bonneville dams would not be repaired if they go down while the government is in shutdown status. However, there will be COE staff available in Walla Walla to maintain the Snake River gages as well as those at McNary Dam.

d. Power System. There was nothing to report.

7. Next TMT Meeting

There was discussion of how the government shutdown, which affects agencies differently, will make TMT coordination more challenging than usual. Already NOAA and USFWS staff are on furlough status, as well as COE district staff, while RCC division staff likely have funding at least through October 16.

The next TMT meeting will be October 16.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Jim Litchfield	Montana
Lisa Wright	COE
Tony Norris	BPA
Agnes Lut	BPA
Laura Hamilton	COE
Karl Kanbergs	COE
Dan Feil	COE
Bill Proctor	COE
Emily Plummer	DSC

<i>Phone:</i>	
Charles Morrill	Washington
Kyle Dittmer	CRITFC
Tom Lorz	CRITFC
Russ Kiefer	Idaho
John Roache	BOR
Heather Dohan	Puget
Steve Hall	COE
Barry Espenson	CBB
Dave Benner	FPC
Margaret Filardo	FPC
Scott Bettin	BPA

TECHNICAL MANAGEMENT TEAM

NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)		
BOR:	John Roache / Mary Mellema	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
COE:	Doug Baus / Karl Kanbergs		

TMT MEETING

Wednesday October 16, 2013 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6824

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

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1. Welcome and Introductions
2. Meeting Minutes
3. Chum Update - Charles Morrill - WDFW
4. Treaty Fishing - Kyle Dittmer - CRITFC
5. Lower Granite Operations - Doug Baus - COE-NWD
6. Water Management Plan - Doug Baus - COE-NWD
7. Operations Review
 - a. Reservoirs

- b. Fish
 - c. Water Quality
 - d. Power System
8. Other
- a. Set agenda and date for next meeting - **October 30, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Dong Baus](#) at (503) 808-3995



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Fisheries Science Center
Fish Ecology Division
2725 Montlake Boulevard East
Seattle, WA 98112-2097
(206) 860-3270

August 28, 2013

MEMORANDUM FOR: F/NWR5 - Bruce Suzumoto

FROM: F/NWC3 - Richard W. Zabel

SUBJECT: Preliminary survival estimates for the passage of
spring-migrating juvenile salmonids through Snake
and Columbia River dams and reservoirs, 2013

This memorandum summarizes conditions in the Snake and Columbia Rivers and preliminary estimates of survival of PIT-tagged juvenile salmonids passing through reservoirs and dams during the 2013 spring outmigration. We also provide preliminary estimates of the proportion of Snake River smolts that were transported from Snake River dams in 2013. Our complete detailed analyses and report for the spring migration will be available by the end of the year. As in past years, changes in the database between the time of our annual summer memo and the publication of our final report may result in differences of up to 3 or 4% in estimated survival values.

Summary of Research

For survival studies funded by BPA in 2013, NOAA Fisheries PIT tagged approximately 17,380 river-run hatchery steelhead, 7,457 wild steelhead, and 11,773 wild yearling Chinook salmon for release into the tailrace of Lower Granite Dam.

Survival estimates provided in this memorandum are derived from PIT-tag data from fish PIT tagged by or for NOAA Fisheries, as described above, along with fish PIT tagged by others within the Columbia River Basin.

For yearling Chinook salmon from Snake River Basin hatcheries, estimated survival to Lower Granite Dam tailrace has been relatively stable since 1998 (Figure 1, Table 1). Mean estimated survival was a composite of production releases from hatcheries

Dworshak, Kooskia, Lookingglass/Imnaha Weir, Rapid River, McCall/Knox Bridge, Pahsimeroi, and Sawtooth and has ranged between 54.9 and 69.7% since 1998. Mean estimated survival to Lower Granite Dam tailrace for the index hatchery release groups in 2013 was 66.7%.

Estimated survival for Snake River yearling Chinook salmon (hatchery and wild combined) in 2013 was above average (1993-2013) in all reaches except the Snake River Trap to Lower Granite Dam tailrace reach and the Lower Granite Dam tailrace to Little Goose tailrace reach (Tables 2 and 4, Figures 2 and 3). Mean estimated survival for yearling Chinook salmon from Lower Granite Dam tailrace to McNary Dam tailrace in 2013 was 78.1% (95% CI: 74.9, 81.2%). Mean estimated survival in 2013 from McNary Dam tailrace to Bonneville Dam tailrace was 79.2% (95% CI: 65.3, 93.1%). Mean estimated survival for yearling Chinook salmon from Lower Granite Dam tailrace to Bonneville Dam tailrace was 61.9% (95% CI: 50.7, 73.0%). Estimated survival for the Lower Granite project (head of reservoir to tailrace) was 84.5%, based on fish PIT tagged at and released from the Snake River trap. The combined yearling Chinook salmon survival estimate from the trap to the Bonneville Dam tailrace in 2013 was 52.3% (95% CI: 42.1, 62.4%).

For Snake River steelhead (hatchery and wild combined), mean estimated survival in 2013 was above the average (1993-2013) in every reach except for the Lower Monumental Dam tailrace to McNary Dam tailrace reach and the McNary Dam tailrace to John Day Dam tailrace reach (Tables 3 and 5, Figures 2 and 3). Mean estimated survival for steelhead from Lower Granite Dam tailrace to McNary Dam tailrace in 2013 was 64.5% (95% CI: 59.4, 69.6%). Mean estimated survival from McNary Dam tailrace to Bonneville Dam tailrace was 79.8% (95% CI: 57.8, 100%). Mean estimated survival from Lower Granite Dam tailrace to Bonneville Dam tailrace was 51.5% (95% CI: 36.7, 66.2%). Estimated survival for the Lower Granite project (head of reservoir to tailrace) was 97.3%, based on fish PIT tagged at and released from the Snake River trap. The combined steelhead survival estimate from the trap to the Bonneville Dam tailrace in 2013 was 50.1% (95% CI: 35.4, 64.8%).

For PIT-tagged hatchery yearling Chinook salmon originating from the upper Columbia River in 2013, estimated survival from McNary Dam tailrace to Bonneville Dam tailrace was 100.0% (95% CI: 85.0, 100.0%; see Table 6).

For PIT-tagged hatchery steelhead originating from the upper Columbia River in 2013, estimated survival from McNary Dam tailrace to Bonneville Dam tailrace was 93.2% (95% CI: 75.7, 100.0%; Table 6). For fish released from upper Columbia River hatcheries, we cannot estimate survival in reaches upstream from McNary Dam (other than the overall reach from release to McNary Dam tailrace) because of limited PIT-tag detection capabilities at Mid-Columbia River PUD dams.

Estimated survival in 2013 of Snake River sockeye salmon (hatchery and wild combined) from the tailrace of Lower Granite Dam to the tailrace of Bonneville Dam was 53.6% (95% CI: 42.1%, 68.2%; Table 7). Estimated survival in 2013 of Columbia River sockeye salmon (hatchery and wild combined) from the tailrace of Rock Island Dam to the tailrace of Bonneville Dam was 48.7% (95% CI: 26.5%, 89.5%; Table 7).

Our preliminary estimates of the proportion transported of non-tagged wild and hatchery spring-summer Chinook salmon smolts are 36.1% and 31.0%, respectively. For steelhead, the estimates are 40.0% and 35.5% for wild and hatchery smolts, respectively. These estimates represent the proportion of smolts that arrived at Lower Granite Dam that were subsequently transported, either from Lower Granite Dam or from one of the downstream collector dams.

Discussion

For Snake River yearling Chinook salmon in 2013, estimated survival from Lower Granite Dam tailrace to Bonneville Dam tailrace was 61.9%, which was the third highest we have observed in the 1999-2013 time series (higher only in 2006 and 2012). However, an unusually low estimated survival of 84.5% from the Snake River Trap to Lower Granite Dam tailrace resulted in an estimated survival through the hydropower system (Snake River trap to Bonneville tailrace) of 52.3%. This hydropower system estimate was lower than the 2012 estimate of 58.8% but not significantly different ($P = 0.32$; Table 4). Estimated survival for yearling Chinook salmon between Lower Granite and McNary Dams in 2013 was 3.9% higher than the long-term average (78.1% vs. 74.2%). Between McNary and Bonneville Dams, estimated survival in 2013 was 8.3% higher than the long-term average (79.2% vs. 70.9%). Chinook survival through the hydropower system has remained relatively stable since 1999 with the exception of lower estimates in 2001 and 2004.

For steelhead in 2013, estimated survival through the hydropower system was 50.1%, which was above the long-term average of 43.2% but also the lowest estimate since 2008 (Table 5). Despite being 9.8% lower than the estimate from 2012 of 59.8%, the two estimates were not significantly different due to the high uncertainty of the 2012 estimate ($P = 0.54$; Table 5). Lower than average estimated mean survival from McNary Dam Tailrace to John Day Dam tailrace (79.9% vs. 80.7% average) and from Lower Monumental Dam tailrace to McNary Dam tailrace (73.9% vs. 75.5% average) contributed to an estimated survival through the hydropower system for steelhead in 2013 which was relatively low in comparison to that of recent years. Survival estimates for weekly release groups from Lower Granite Dam indicated that survival for steelhead decreased through the last few weeks of the season from Lower Granite Dam tailrace to McNary Dam tailrace. This pattern has been observed in previous years and could be caused by increased predation and increasing temperatures during that period.

Mean flow volume at Little Goose Dam in 2013 during the main migration period (1 April - 15 June) was 67.8 kcfs, which was below the long-term (1993-2013) mean of 92.0 kcfs, and fifth lowest among mean flows over the past 21 years. Daily flow volumes were below average for much of the season, but were above average from 9-16 May as a pulse of flow moved through (Figure 4). Mean water temperature at Little Goose Dam in 2013 during the migration period was 11.3 °C, which is slightly above the long-term mean of 11.1 °C. Daily water temperatures fluctuated around the long term daily averages, with excursions above average occurring during 4-12 April, 2-16 May, and 3-15 June (Figure 4).

Mean spill volume at the Snake River dams during the 2013 migration was 22.3 kcfs, which was a little below the long-term mean of 25.9 kcfs. Daily spill volumes remained near the long-term daily averages until going below average during 15 May through 15 June (Figure 5). Mean spill as a percentage of flow at the Snake River dams during the 2013 migration was 33.5%, which was above the long-term mean of 25.1%. Daily average spill percentages in 2013 were above the long-term daily averages for the entire migration except for the period 9-18 May, which corresponded to the period of increased flow. In general, river conditions during the 2013 spring migration could be categorized as low flow with moderately high temperatures at times and with above average spill percentages. These conditions are similar to those that occurred in 2007 and 2010.

Estimated percentages of yearling Chinook salmon and steelhead transported from Snake River dams in 2013 were greater than the record low percentages estimated in 2012. The increase was due to a combination of an earlier start date of transportation and a later arrival of smolts at Lower Granite Dam in 2013. Collection for transportation in 2013 began on 27 April at Lower Granite Dam, 3 May at Little Goose Dam, and 7 May at Lower Monumental Dam. In comparison, the transportation start date at Lower Granite Dam in 2012 was 2 May; five days later than in 2013. However, transportation start dates at the other two collector dams in 2013 were actually one day later than those in 2012. When smolt transportation started at Lower Granite Dam in 2013, approximately 26% of Chinook and 26% of steelhead smolts had already passed the dam. Smolt passage increased rapidly with increasing flow in early May (Figures 4 and 6), and 90% passage at Lower Granite Dam occurred by approximately 14 May for Chinook and 17 May for steelhead. Throughout the migration season, relatively high spill percentages in combination with continuous operation of surface bypass collectors at each of the collector dams on the Snake River resulted in low proportions of fish entering juvenile bypass systems. Low flow conditions in 2013 may have increased spillway passage because lower water velocities allow fish more time to react to conditions and may increase the attractiveness of surface bypass collectors. During the period of general transportation in 2013, we estimate that approximately 46% of Chinook and 51% of steelhead smolts that arrived at Lower Granite Dam were transported from one of the collector dams. These percentages are actually lower than those estimated for 2012 (59% Chinook and 62% steelhead). Despite the increase over 2012 estimates, the transport percentages for 2013 are still among the lowest estimated over the period for which we have estimates (1993-2013).

cc: F/NWC3 - Faulkner
F/NWC3 - Marsh
F/NWC3 - Smith
F/NWC3 - Widener
F/NWC3 - Zabel

Table 1. Mean estimated survival and standard error (s.e.) for yearling **Chinook** salmon released at Snake River Basin and Upper Columbia River hatcheries to Lower Granite Dam tailrace (LGR) and McNary Dam tailrace (MCN), 2011 through 2013.

Hatchery	2011		2012		2013 ^a	
	Survival to LGR (s.e.)	Survival to MCN (s.e.)	Survival to LGR (s.e.)	Survival to MCN (s.e.)	Survival to LGR (s.e.)	Survival to MCN (s.e.)
Dworshak	0.722 (0.006)	0.511 (0.010)	0.743 (0.008)	0.642 (0.013)	0.794 (0.015)	0.661 (0.014)
Kooskia	0.729 (0.014)	0.542 (0.029)	0.652 (0.013)	0.409 (0.018)	0.609 (0.026)	0.487 (0.022)
Lookingglass (Catherine Cr.)	0.300 (0.007)	0.228 (0.020)	0.345 (0.007)	0.286 (0.015)	0.220 (0.007)	0.210 (0.018)
Lookingglass (Grande Ronde)	0.434 (0.019)	0.386 (0.097)	0.453 (0.018)	0.350 (0.033)	0.382 (0.024)	0.438 (0.097)
Lookingglass (Imnaha River)	0.572 (0.009)	0.424 (0.025)	0.689 (0.009)	0.568 (0.017)	0.703 (0.019)	0.633 (0.026)
Lookingglass (Lostine River)	0.490 (0.022)	0.409 (0.097)	0.665 (0.017)	0.546 (0.035)	0.604 (0.014)	0.585 (0.050)
McCall (Johnson Cr.)	0.264 (0.015)	0.222 (0.053)	0.357 (0.016)	0.370 (0.049)	0.554 (0.026)	0.469 (0.064)
McCall (Knox Bridge)	0.631 (0.007)	0.469 (0.018)	0.571 (0.006)	0.561 (0.012)	0.656 (0.011)	0.605 (0.018)
Pahsimeroi	0.498 (0.005)	0.371 (0.010)	0.581 (0.006)	0.438 (0.012)	0.606 (0.016)	0.570 (0.021)
Rapid River	0.766 (0.006)	0.533 (0.016)	0.718 (0.014)	0.634 (0.030)	0.735 (0.011)	0.653 (0.021)
Sawtooth	0.521 (0.007)	0.370 (0.024)	0.473 (0.008)	0.398 (0.016)	0.564 (0.011)	0.575 (0.033)
Entiat	---	0.536 (0.041)	---	0.681 (0.042)	---	0.627 (0.049)
Winthrop	---	0.529 (0.051)	---	0.535 (0.036)	---	0.571 (0.034)
Leavenworth	---	0.432 (0.022)	---	0.589 (0.020)	---	0.616 (0.026)

a. Estimates are preliminary and subject to change.

Table 2. Annual weighted means of survival probability estimates for yearling **Chinook** salmon (hatchery and wild combined), 1993–2013. Standard errors in parentheses. Reaches with asterisks comprise two dams and reservoirs (i.e., two projects); the following column gives the square root (i.e., geometric mean) of the two–project estimate to facilitate comparison with other single–project estimates. Simple arithmetic means across all years are given. Abbreviations: Trap–Snake River Trap; LGR–Lower Granite Dam; LGO–Little Goose Dam; LMO–Lower Monumental Dam; IHR–Ice Harbor Dam; MCN–McNary Dam; JDA–John Day Dam; TDA–The Dalles Dam; BON–Bonneville Dam.

Year	Trap–LGR	LGR–LGO	LGO–LMO	LMO–MCN*	LMO–IHR IHR–MCN	MCN–JDA	JDA–BON*	JDA–TDA TDA–BON
1993	0.828 (0.013)	0.854 (0.012)						
1994	0.935 (0.023)	0.830 (0.009)	0.847 (0.010)					
1995	0.905 (0.010)	0.882 (0.004)	0.925 (0.008)	0.876 (0.038)	0.936			
1996	0.977 (0.025)	0.926 (0.006)	0.929 (0.011)	0.756 (0.033)	0.870			
1997	NA	0.942 (0.018)	0.894 (0.042)	0.798 (0.091)	0.893			
1998	0.925 (0.009)	0.991 (0.006)	0.853 (0.009)	0.915 (0.011)	0.957	0.822 (0.033)		
1999	0.940 (0.009)	0.949 (0.002)	0.925 (0.004)	0.904 (0.007)	0.951	0.853 (0.027)	0.814 (0.065)	0.902
2000	0.929 (0.014)	0.938 (0.006)	0.887 (0.009)	0.928 (0.016)	0.963	0.898 (0.054)	0.684 (0.128)	0.827
2001	0.954 (0.015)	0.945 (0.004)	0.830 (0.006)	0.708 (0.007)	0.841	0.758 (0.024)	0.645 (0.034)	0.803
2002	0.953 (0.022)	0.949 (0.006)	0.980 (0.008)	0.837 (0.013)	0.915	0.907 (0.014)	0.840 (0.079)	0.917
2003	0.993 (0.023)	0.946 (0.005)	0.916 (0.011)	0.904 (0.017)	0.951	0.893 (0.017)	0.818 (0.036)	0.904
2004	0.893 (0.009)	0.923 (0.004)	0.875 (0.012)	0.818 (0.018)	0.904	0.809 (0.028)	0.735 (0.092)	0.857
2005	0.919 (0.015)	0.919 (0.003)	0.886 (0.006)	0.903 (0.010)	0.950	0.772 (0.029)	1.028 (0.132)	1.014
2006	0.952 (0.011)	0.923 (0.003)	0.934 (0.004)	0.887 (0.008)	0.942	0.881 (0.020)	0.944 (0.030)	0.972
2007	0.943 (0.028)	0.938 (0.006)	0.957 (0.010)	0.876 (0.012)	0.936	0.920 (0.016)	0.824 (0.043)	0.908
2008	0.992 (0.018)	0.939 (0.006)	0.950 (0.011)	0.878 (0.016)	0.937	1.073 (0.058)	0.558 (0.082)	0.750
2009	0.958 (0.010)	0.940 (0.006)	0.982 (0.009)	0.855 (0.011)	0.925	0.866 (0.042)	0.821 (0.043)	0.906
2010	0.968 (0.040)	0.962 (0.011)	0.973 (0.019)	0.851 (0.017)	0.922	0.947 (0.021)	0.780 (0.039)	0.883
2011	0.943 (0.009)	0.919 (0.007)	0.966 (0.008)	0.845 (0.012)	0.919	0.893 (0.026)	0.766 (0.080)	0.875
2012	0.928 (0.012)	0.907 (0.009)	0.939 (0.010)	0.937 (0.016)	0.968	0.915 (0.023)	0.866 (0.058)	0.931
2013 ^a	0.845 (0.031)	0.922 (0.012)	0.983 (0.014)	0.904 (0.022)	0.951	0.938 (0.058)	0.827 (0.043)	0.909
Mean	0.934 (0.009)	0.926 (0.008)	0.922 (0.011)	0.862 (0.014)	0.928	0.884 (0.019)	0.797 (0.029)	0.890

a. Estimates are preliminary and subject to change.

Table 3. Annual weighted means of survival probability estimates for **steelhead** (hatchery and wild combined), 1993–2013. Standard errors in parentheses. Reaches with asterisks comprise two dams and reservoirs (i.e., two projects); the following column gives the square root (i.e., geometric mean) of the two–project estimate to facilitate comparison with other single–project estimates. Simple arithmetic means across all years are given. Abbreviations: Trap–Snake River Trap; LGR–Lower Granite Dam; LGO–Little Goose Dam; LMO–Lower Monumental Dam; IHR–Ice Harbor Dam; MCN–McNary Dam; JDA–John Day Dam; TDA–The Dalles Dam; BON–Bonneville Dam.

Year	Trap–LGR	LGR–LGO	LGO–LMO	LMO–MCN*	LMO–IHR IHR–MCN	MCN–JDA	JDA–BON*	JDA–TDA TDA–BON
1993	0.905 (0.006)							
1994	NA	0.844 (0.011)	0.892 (0.011)					
1995	0.945 (0.008)	0.899 (0.005)	0.962 (0.011)	0.858 (0.076)	0.926			
1996	0.951 (0.015)	0.938 (0.008)	0.951 (0.014)	0.791 (0.052)	0.889			
1997	0.964 (0.015)	0.966 (0.006)	0.902 (0.020)	0.834 (0.065)	0.913			
1998	0.924 (0.009)	0.930 (0.004)	0.889 (0.006)	0.797 (0.018)	0.893	0.831 (0.031)	0.935 (0.103)	0.967
1999	0.908 (0.011)	0.926 (0.004)	0.915 (0.006)	0.833 (0.011)	0.913	0.920 (0.033)	0.682 (0.039)	0.826
2000	0.964 (0.013)	0.901 (0.006)	0.904 (0.009)	0.842 (0.016)	0.918	0.851 (0.045)	0.754 (0.045)	0.868
2001	0.911 (0.007)	0.801 (0.010)	0.709 (0.008)	0.296 (0.010)	0.544	0.337 (0.025)	0.753 (0.063)	0.868
2002	0.895 (0.015)	0.882 (0.011)	0.882 (0.018)	0.652 (0.031)	0.807	0.844 (0.063)	0.612 (0.098)	0.782
2003	0.932 (0.015)	0.947 (0.005)	0.898 (0.012)	0.708 (0.018)	0.841	0.879 (0.032)	0.630 (0.066)	0.794
2004	0.948 (0.004)	0.860 (0.006)	0.820 (0.014)	0.519 (0.035)	0.720	0.465 (0.078)	NA	NA
2005	0.967 (0.004)	0.940 (0.004)	0.867 (0.009)	0.722 (0.023)	0.850	0.595 (0.040)	NA	NA
2006	0.920 (0.013)	0.956 (0.004)	0.911 (0.006)	0.808 (0.017)	0.899	0.795 (0.045)	0.813 (0.083)	0.902
2007	1.016 (0.026)	0.887 (0.009)	0.911 (0.022)	0.852 (0.030)	0.923	0.988 (0.098)	0.579 (0.059)	0.761
2008	0.995 (0.018)	0.935 (0.007)	0.961 (0.014)	0.776 (0.017)	0.881	0.950 (0.066)	0.742 (0.045)	0.861
2009	1.002 (0.011)	0.972 (0.005)	0.942 (0.008)	0.863 (0.014)	0.929	0.951 (0.026)	0.900 (0.079)	0.949
2010	1.017 (0.030)	0.965 (0.028)	0.984 (0.044)	0.876 (0.032)	0.936	0.931 (0.051)	0.840 (0.038)	0.917
2011	0.986 (0.017)	0.955 (0.004)	0.948 (0.010)	0.772 (0.014)	0.879	0.960 (0.043)	0.858 (0.051)	0.926
2012	1.001 (0.026)	0.959 (0.006)	0.914 (0.011)	0.811 (0.022)	0.901	0.814 (0.048)	1.021 (0.148)	1.010
2013 ^a	0.973 (0.032)	0.921 (0.020)	0.977 (0.020)	0.739 (0.031)	0.860	0.799 (0.025)	1.026 (0.154)	1.013
Mean	0.956 (0.009)	0.919 (0.010)	0.907 (0.014)	0.755 (0.032)	0.864	0.807 (0.046)	0.796 (0.038)	0.889

a. Estimates are preliminary and subject to change.

Table 4. Hydropower system survival estimates derived by combining empirical survival estimates from various reaches for Snake River yearling **Chinook** salmon (hatchery and wild combined), 1997–2013. Standard errors in parentheses. Simple arithmetic means across all years are given. Abbreviations: Trap–Snake River Trap; LGR–Lower Granite Dam; MCN–McNary Dam; BON–Bonneville Dam.

Year	Trap–LGR	LGR–MCN	MCN–BON	LGR–BON	Trap–BON
1997	NA	0.653 (0.072)	NA	NA	NA
1998	0.924 (0.011)	0.770 (0.009)	NA	NA	NA
1999	0.940 (0.009)	0.792 (0.006)	0.704 (0.058)	0.557 (0.046)	0.524 (0.043)
2000	0.929 (0.014)	0.760 (0.012)	0.640 (0.122)	0.486 (0.093)	0.452 (0.087)
2001	0.954 (0.015)	0.556 (0.009)	0.501 (0.027)	0.279 (0.016)	0.266 (0.016)
2002	0.953 (0.022)	0.757 (0.009)	0.763 (0.079)	0.578 (0.060)	0.551 (0.059)
2003	0.993 (0.023)	0.731 (0.010)	0.728 (0.030)	0.532 (0.023)	0.528 (0.026)
2004	0.893 (0.009)	0.666 (0.011)	0.594 (0.074)	0.395 (0.050)	0.353 (0.045)
2005	0.919 (0.015)	0.732 (0.009)	0.788 (0.093)	0.577 (0.068)	0.530 (0.063)
2006	0.952 (0.011)	0.764 (0.007)	0.842 (0.021)	0.643 (0.017)	0.612 (0.018)
2007	0.943 (0.028)	0.783 (0.006)	0.763 (0.044)	0.597 (0.035)	0.563 (0.037)
2008	0.992 (0.018)	0.782 (0.011)	0.594 (0.066)	0.465 (0.052)	0.460 (0.052)
2009	0.958 (0.010)	0.787 (0.007)	0.705 (0.031)	0.555 (0.025)	0.531 (0.025)
2010	0.968 (0.040)	0.772 (0.012)	0.738 (0.039)	0.569 (0.032)	0.551 (0.038)
2011	0.943 (0.009)	0.746 (0.010)	0.687 (0.065)	0.513 (0.049)	0.483 (0.046)
2012	0.928 (0.012)	0.790 (0.016)	0.802 (0.051)	0.634 (0.042)	0.588 (0.040)
2013 ^a	0.845 (0.031)	0.781 (0.016)	0.792 (0.071)	0.619 (0.057)	0.523 (0.052)
Mean	0.940 (0.009)	0.742 (0.015)	0.709 (0.024)	0.533 (0.025)	0.501 (0.023)

a. Estimates are preliminary and subject to change.

Table 5. Hydropower system survival estimates derived by combining empirical survival estimates from various reaches for Snake River **steelhead** (hatchery and wild combined), 1997–2013. Standard errors in parentheses. Simple arithmetic means across all years are given. Abbreviations: Trap–Snake River Trap; LGR–Lower Granite Dam; MCN–McNary Dam; BON–Bonneville Dam.

Year	Trap–LGR	LGR-MCN	MCN-BON	LGR–BON	Trap–BON
1997	1.020 (0.023)	0.728 (0.053)	0.651 (0.082)	0.474 (0.069)	0.484 (0.072)
1998	0.924 (0.009)	0.649 (0.013)	0.770 (0.081)	0.500 (0.054)	0.462 (0.050)
1999	0.908 (0.011)	0.688 (0.010)	0.640 (0.024)	0.440 (0.018)	0.400 (0.017)
2000	0.964 (0.013)	0.679 (0.016)	0.580 (0.040)	0.393 (0.034)	0.379 (0.033)
2001	0.911 (0.007)	0.168 (0.006)	0.250 (0.016)	0.042 (0.003)	0.038 (0.003)
2002	0.895 (0.015)	0.536 (0.025)	0.488 (0.090)	0.262 (0.050)	0.234 (0.045)
2003	0.932 (0.015)	0.597 (0.013)	0.518 (0.015)	0.309 (0.011)	0.288 (0.012)
2004	0.948 (0.004)	0.379 (0.023)	NA	NA	NA
2005	0.967 (0.004)	0.593 (0.018)	NA	NA	NA
2006	0.920 (0.013)	0.702 (0.016)	0.648 (0.079)	0.455 (0.056)	0.418 (0.052)
2007	1.016 (0.026)	0.694 (0.020)	0.524 (0.064)	0.364 (0.045)	0.369 (0.047)
2008	0.995 (0.018)	0.716 (0.015)	0.671 (0.034)	0.480 (0.027)	0.478 (0.028)
2009	1.002 (0.011)	0.790 (0.013)	0.856 (0.074)	0.676 (0.059)	0.678 (0.060)
2010	1.017 (0.030)	0.770 (0.020)	0.789 (0.027)	0.608 (0.026)	0.618 (0.032)
2011	0.986 (0.017)	0.693 (0.013)	0.866 (0.038)	0.600 (0.029)	0.592 (0.030)
2012	1.001 (0.026)	0.698 (0.020)	0.856 (0.196)	0.597 (0.138)	0.598 (0.139)
2013 ^a	0.973 (0.032)	0.645 (0.026)	0.798 (0.112)	0.515 (0.075)	0.501 (0.075)
Mean	0.963 (0.010)	0.631 (0.037)	0.660 (0.044)	0.448 (0.041)	0.436 (0.043)

a. Estimates are preliminary and subject to change.

Table 6. Estimated survival and standard error (s.e.) through reaches of the lower Columbia River hydropower system for hatchery yearling **Chinook** salmon and **steelhead** originating in the upper Columbia River, 1999–2013. Abbreviations: Rel–Release site; MCN–McNary Dam; JDA–John Day Dam; BON–Bonneville Dam.

Year	Yearling Chinook Salmon				Steelhead			
	Rel–MCN	MCN–JDA	JDA–BON	MCN–BON	Rel–MCN	MCN–JDA	JDA–BON	MCN–BON
1999	0.572 (0.014)	0.896 (0.044)	0.795 (0.129)	0.712 (0.113)				
2000	0.539 (0.025)	0.781 (0.094)	NA	NA				
2001	0.428 (0.009)	0.881 (0.062)	NA	NA				
2002	0.555 (0.003)	0.870 (0.011)	0.940 (0.048)	0.817 (0.041)				
2003	0.625 (0.003)	0.900 (0.008)	0.977 (0.035)	0.879 (0.031)	0.471 (0.004)	0.997 (0.012)	0.874 (0.036)	0.871 (0.036)
2004	0.507 (0.005)	0.812 (0.019)	0.761 (0.049)	0.618 (0.038)	0.384 (0.005)	0.794 (0.021)	1.037 (0.112)	0.823 (0.088)
2005	0.545 (0.012)	0.751 (0.042)	NA	NA	0.399 (0.004)	0.815 (0.017)	0.827 (0.071)	0.674 (0.057)
2006	0.520 (0.011)	0.954 (0.051)	0.914 (0.211)	0.871 (0.198)	0.397 (0.008)	0.797 (0.026)	0.920 (0.169)	0.733 (0.134)
2007	0.584 (0.009)	0.895 (0.028)	0.816 (0.091)	0.730 (0.080)	0.426 (0.016)	0.944 (0.064)	0.622 (0.068)	0.587 (0.059)
2008	0.582 (0.019)	1.200 (0.085)	0.522 (0.114)	0.626 (0.133)	0.438 (0.015)	NA	NA	NA
2009	0.523 (0.013)	0.847 (0.044)	1.056 (0.143)	0.895 (0.116)	0.484 (0.018)	0.809 (0.048)	0.935 (0.133)	0.756 (0.105)
2010	0.660 (0.014)	0.924 (0.040)	0.796 (0.046)	0.735 (0.037)	0.512 (0.017)	0.996 (0.054)	0.628 (0.038)	0.626 (0.033)
2011	0.534 (0.010)	1.042 (0.047)	0.612 (0.077)	0.637 (0.077)	0.435 (0.012)	1.201 (0.064)	0.542 (0.101)	0.651 (0.119)
2012	0.576 (0.012)	0.836 (0.035)	1.140 (0.142)	0.953 (0.115)	0.281 (0.011)	0.862 (0.047)	1.240 (0.186)	1.069 (0.159)
2013 ^a	0.555 (0.013)	0.965 (0.050)	1.095 (0.129)	1.056 (0.117)	0.384 (0.020)	0.957 (0.071)	0.974 (0.104)	0.932 (0.099)
Mean	0.554 (0.014)	0.904 (0.028)	0.869 (0.054)	0.794 (0.040)	0.419 (0.020)	0.917 (0.041)	0.860 (0.068)	0.772 (0.048)

a. Estimates are preliminary and subject to change.

Table 7. Estimated survival and standard error (s.e.) for **sockeye** salmon (hatchery and wild combined) from Lower Granite Dam tailrace to Bonneville Dam tailrace for fish originating in the Snake River, and from Rock Island Dam tailrace to Bonneville Dam tailrace for fish originating in the upper Columbia River, 1996–2013. Note that this table represents all available data on sockeye, and so estimates are provided regardless of the size of their associated standard errors. The estimates to Bonneville tailrace are of questionable quality in several cases due to small release sizes and low detection probabilities. Abbreviations: LGR–Lower Granite Dam; MCN–McNary Dam; BON–Bonneville Dam; RIS–Rock Island Dam.

Year	Snake River Sockeye			Upper Columbia River Sockeye		
	LGR-MCN	MCN-BON	LGR-BON	RIS-MCN	MCN-BON	RIS-BON
1996	0.283 (0.184)	NA	NA	NA	NA	NA
1997	NA	NA	NA	0.397 (0.119)	NA	NA
1998	0.689 (0.157)	0.142 (0.099)	0.177 (0.090)	0.624 (0.058)	1.655 (1.617)	1.033 (1.003)
1999	0.655 (0.083)	0.841 (0.584)	0.548 (0.363)	0.559 (0.029)	0.683 (0.177)	0.382 (0.097)
2000	0.679 (0.110)	0.206 (0.110)	0.161 (0.080)	0.487 (0.114)	0.894 (0.867)	0.435 (0.410)
2001	0.205 (0.063)	0.105 (0.050)	0.022 (0.005)	0.657 (0.117)	NA	NA
2002	0.524 (0.062)	0.684 (0.432)	0.342 (0.212)	0.531 (0.044)	0.286 (0.110)	0.152 (0.057)
2003	0.669 (0.054)	0.551 (0.144)	0.405 (0.098)	NA	NA	NA
2004	0.741 (0.254)	NA	NA	0.648 (0.114)	1.246 (1.218)	0.808 (0.777)
2005	0.388 (0.078)	NA	NA	0.720 (0.140)	0.226 (0.209)	0.163 (0.147)
2006	0.630 (0.083)	1.113 (0.652)	0.820 (0.454)	0.793 (0.062)	0.767 (0.243)	0.608 (0.187)
2007	0.679 (0.066)	0.259 (0.084)	0.272 (0.073)	0.625 (0.046)	0.642 (0.296)	0.401 (0.183)
2008	0.763 (0.103)	0.544 (0.262)	0.404 (0.179)	0.644 (0.094)	0.679 (0.363)	0.437 (0.225)
2009	0.749 (0.032)	0.765 (0.101)	0.573 (0.073)	0.853 (0.076)	0.958 (0.405)	0.817 (0.338)
2010	0.723 (0.039)	0.752 (0.098)	0.544 (0.077)	0.778 (0.063)	0.627 (0.152)	0.488 (0.111)
2011	0.659 (0.033)	NA	NA	0.742 (0.088)	0.691 (0.676)	0.513 (0.498)
2012	0.762 (0.032)	0.619 (0.084)	0.472 (0.062)	0.945 (0.085)	0.840 (0.405)	0.794 (0.376)
2013 ^a	0.691 (0.043)	0.776 (0.106)	0.536 (0.066)	0.741 (0.068)	0.658 (0.217)	0.487 (0.155)
Mean	0.617 (0.041)	0.566 (0.085)	0.406 (0.059)	0.671 (0.035)	0.775 (0.096)	0.537 (0.067)

a. Estimates are preliminary and subject to change.

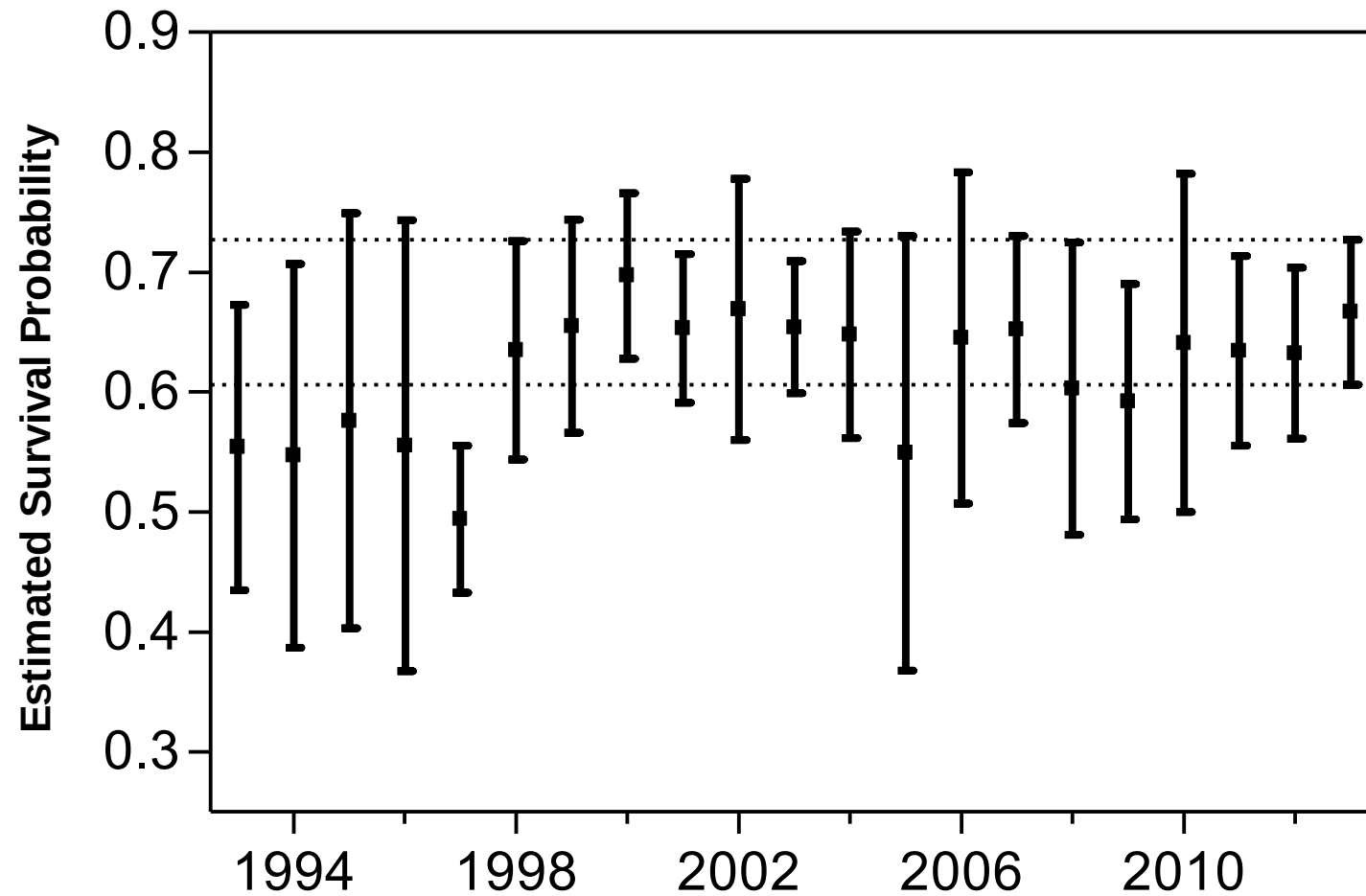


Figure 1. Annual average survival estimates from release to Lower Granite Dam for PIT-tagged yearling **Chinook** salmon released from Snake River Basin hatcheries, 1993-2013. Hatcheries used for average (index groups) are those with PIT-tag releases through a long series of years. Vertical bars represent 95% confidence intervals. Horizontal dashed lines are the 2013 confidence interval endpoints and are shown for comparison to other years.

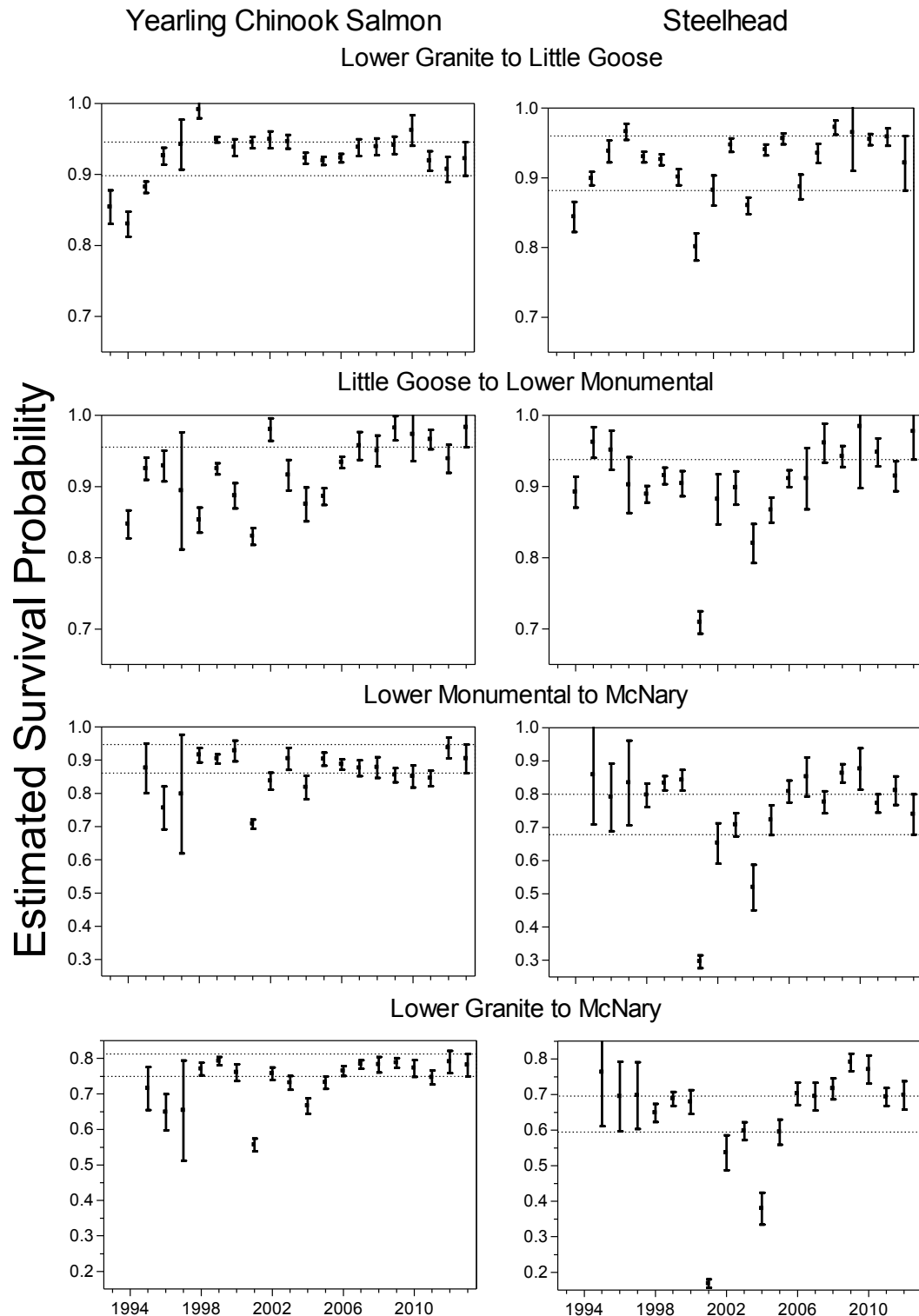


Figure 2. Annual average survival estimates for PIT-tagged yearling **Chinook** salmon and **steelhead**, hatchery and wild fish combined. Vertical bars represent 95% confidence intervals. Horizontal dashed lines are 95% confidence interval endpoints for 2013 estimates.

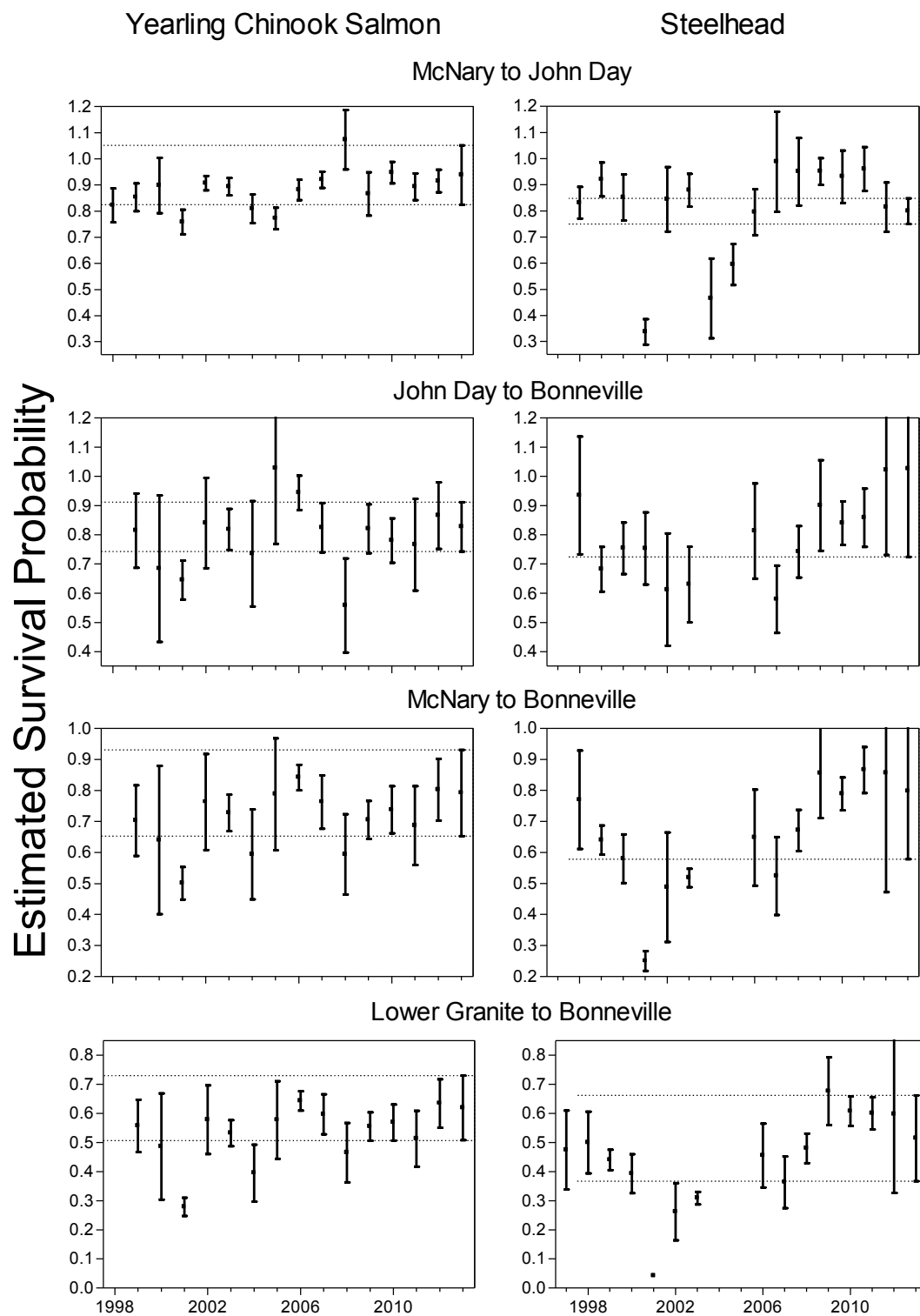


Figure 3. Annual average survival estimates for PIT-tagged yearling **Chinook** salmon and **steelhead**, hatchery and wild fish combined. Vertical bars represent 95% confidence intervals. Horizontal dashed lines are 95% confidence interval endpoints for 2013 estimates.

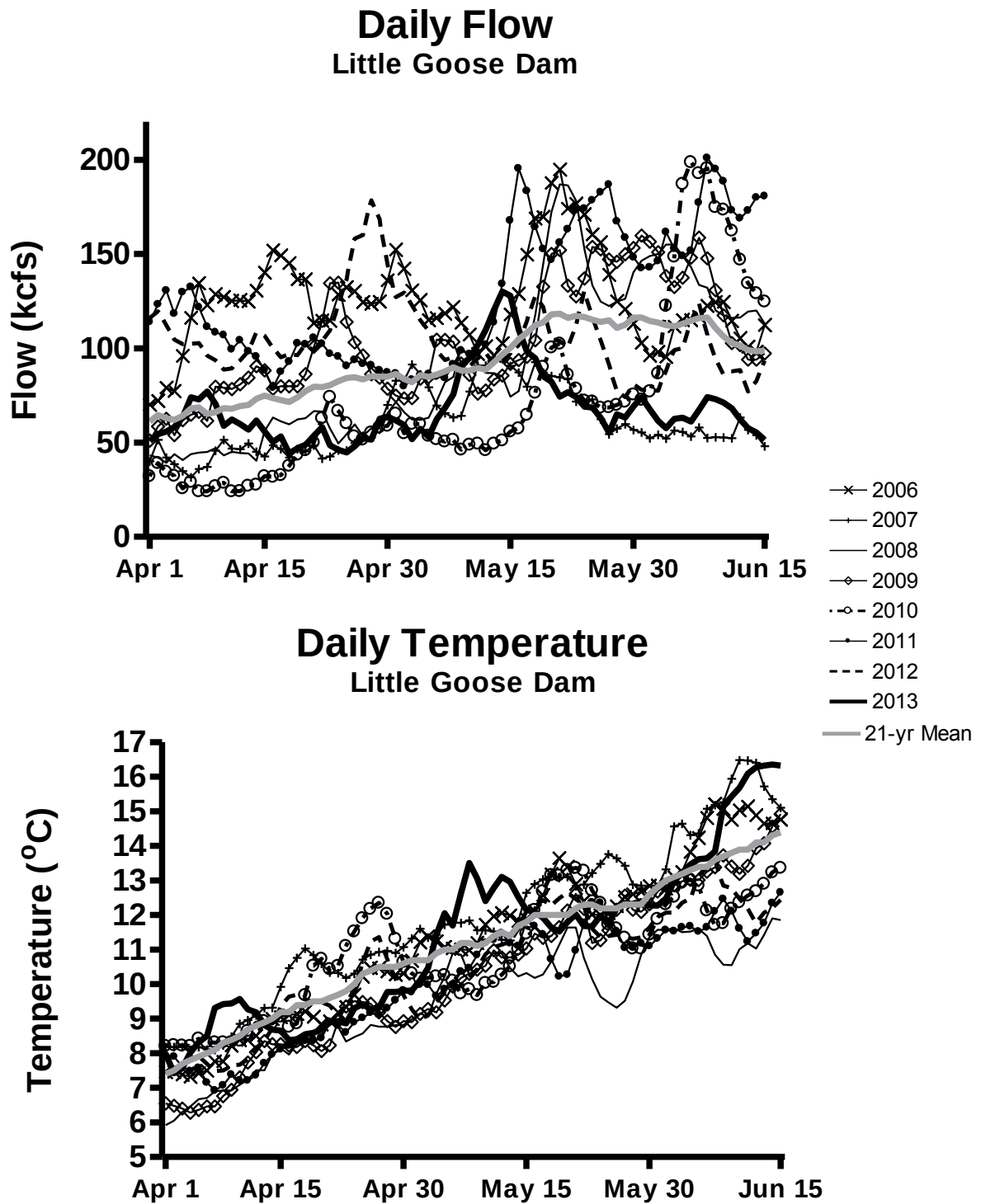


Figure 4. Snake River flow (kcfs; top panel) and water temperature (°C; bottom panel) measured at Little Goose Dam during April and May, 2006-2013, including daily long-term means (1993-2013).

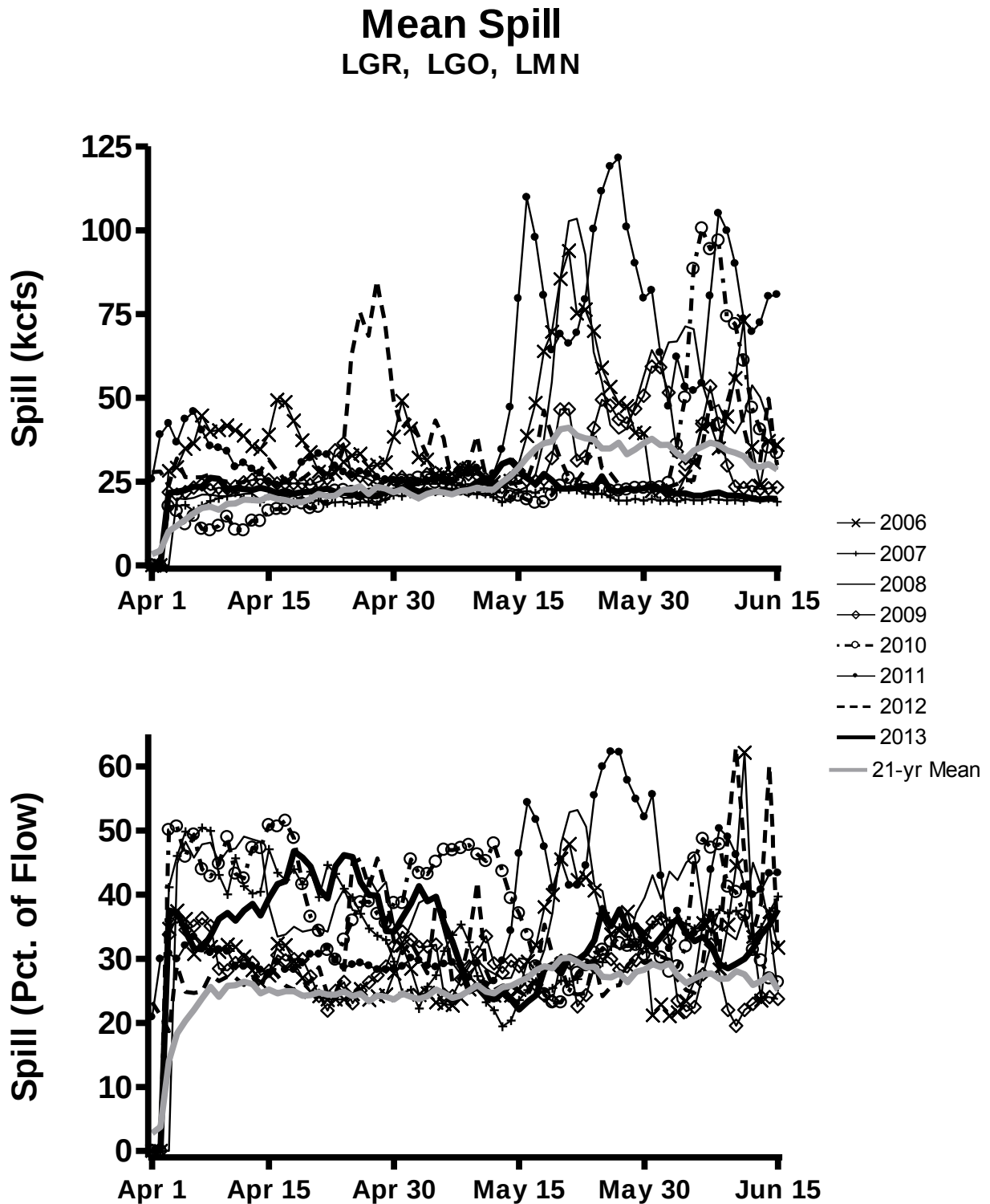
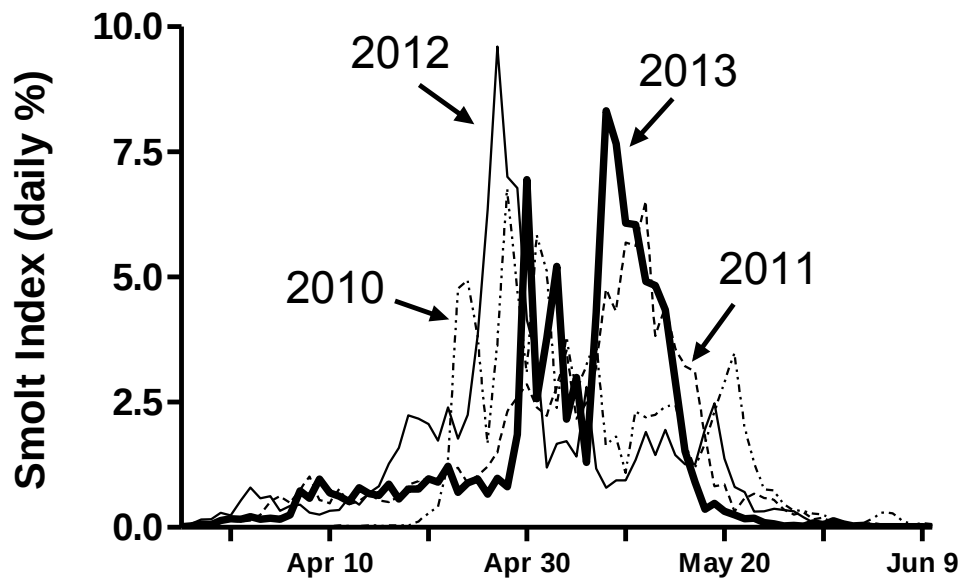


Figure 5. Mean spill (top panel shows kcfs; bottom panel shows percentage of total flow) at Snake River dams during April and May, 2006-2013, including daily long-term means (1993-2013).

Smolt Passage at Lower Granite Dam

Yearling Chinook



Steelhead

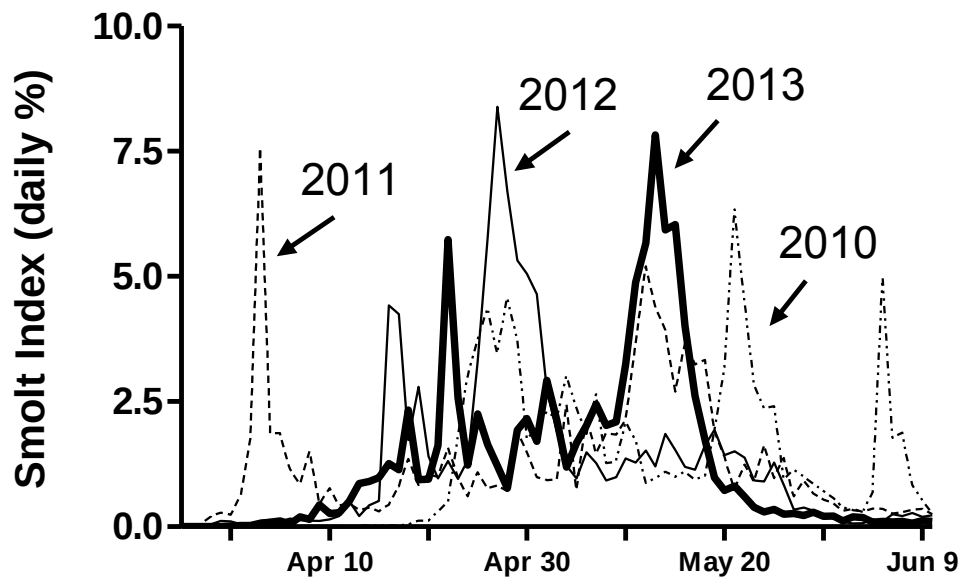


Figure 6. Smolt index as daily percentage of total passage at Lower Granite Dam 2010-2013 for hatchery and wild combined yearling Chinook and steelhead.

TECHNICAL MANAGEMENT TEAM

NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)		
BOR:	John Roache / Mary Mellema	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
COE:	Doug Baus / Karl Kanbergs		

TMT MEETING

Wednesday October 30, 2013 9:00am - 12:00pm

Portland State Building, Room 918
800 NE Oregon Street
Portland, Oregon 97232
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6374

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Please MUTE your Phone

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnv.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes - [September 18 and October 2](#)
3. Chum Update - Charles Morrill - WDFW, and Doug Baus - COE-NWD
4. Dworshak Operations Safety Concerns - Russ Kiefer - IDFG
5. 2013 - Preliminary Survival Estimates - Paul Wagner - NOAA Fisheries
 - a. [Memo](#)
6. Water Management Plan - Doug Baus - COE-NWD

7. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
8. Other
 - a. Set agenda and date for next meeting - **November 6, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

October 30, 2013

Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Review of Minutes

The official TMT minutes and Facilitator's Summary for the September 18th and October 2nd were posted, reviewed by TMT members and approved.

Chum Update

Charles Morrill (WDFW) reported that five Chum have passed Bonneville and Chum are expected to arrive in the Ives area this weekend with the forecasted rain. The next survey will be done on 11/5. FPAC will check in on Chum numbers at their meeting on 11/5, followed by a TMT call on 11/6 at which they expect to confirm Chum presence and ask that Chum operations be implemented as soon as possible. The Action Agencies will plan to implement Chum operations on November 7th, pending the TMT check-in scheduled for November 6th. The operation will target a tailwater elevation of 11.5ft with a band of 11.3 to 11.7ft. COE reported that due to construction efficiencies, the lamprey flume work is ahead of schedule and is not expected to conflict with the Chum operation. In response to a question, Tom Lorz (CRITFC) assured TMT that CRITFC Enforcement will monitor Hamilton Springs for gill net use in the area.

Action: Charles Morrill will provide the next survey results to COE for posting on the TMT website. The Action Agencies will prepare to implement the operation on 11/7, pending the salmon managers' request next week.

Dworshak Operations Safety Concerns

Russ Kiefer, Idaho, suggested TMT review the January 9, 2013 TMT notes at which a process was outlined for how COE informs anglers about changing river elevations. Russ reported that another angler was recently stranded on a gravel bar and fortunately made it safely back to shore. COE was unable to provide details as to the operation due to unavailability of project staff, however, will address concerns at the next TMT meeting on November 6th.

Action: Doug Baus, COE, will coordinate with Walla Walla District to provide more information to TMT at the November 6th conference call. The group will discuss:

1. What happened at the project?
2. What is the notification process?
 - a. Were protocols followed?
 - b. Is the current procedure working?
 - c. Are there changes that need to be made?

2013- Preliminary Survival Estimates

Paul Wagner, NOAA, reported on the 2013 preliminary survival estimates. He noted these estimates are subject to change slightly. Generally, the yearling Chinook survival rates were above the 13-year average, however, survival rates from the Trap-Lower Granite reach brought the overall average down. Steelhead survival rates were slightly higher than the 13 year average, with the exception of the McNary to John Day reach, where survival rates decreased. Survival rates of both Chinook and Steelhead in the Upper Columbia were in line with

the 13 year averages. Sockeye in the Snake River system are comparable to the long-term averages, however, there was a decrease in the Rock Island to Bonneville reach. The wild and hatchery spring Chinook transportation percentage is low for 2013.

The following questions and theories were posed by the group:

- There was inquiry as to if there are reach specific survival targets. Paul Wagner responded that there are not reach survival targets, however, there are project survival targets. Russ Kiefer, Idaho, added that reach survival estimates are used to gauge whether overall survival targets are being met.
- There was clarification that the mean recorded in the tables in the Memo are an average of all 13 years listed, not the 10 year averages.
- There was inquiry as to if there is a difference in run timing between upper Columbia and Snake River fish passing McNary Dam. Paul responded that after a quick look at the passage index it seemed that there was a slight difference. However, more analysis is needed.
- Low flows, fluctuating flows through the river, and/or collection estimates methodology may contribute to the anomaly seen with the drop in yearling Chinook survival between the Trap and Lower Granite.
- Increased bird predation at the McNary Dam outfall may influence survival rates in the McNary to John Day reach.
- The proportion of spill and collection changes throughout the system may affect reach survival rates, however, is likely to balance throughout the entire system. It was suggested that NOAA and USFWS to look into this.

More information will be provided at the TMT Year End Review on December 12th. Additionally, more details on the specific estimated survival rates are available on the Memo posted on the October 30th, TMT Agenda.

Water Management Plan

Doug Baus, COE, reminded the group that as of October 1st, the draft 2014 Water Management Plan has been posted to the TMT website, along with a schedule for drafts and edits. Please note the following schedule:

- TMT edits on the 1st draft are due by October 31st.
- Edits will be incorporated accordingly and another draft will be posted by the first week of November.
- TMT edits on the 2nd draft are due by November 15th.
- Edits will be incorporated accordingly the following draft will be posted on November 28th.
- The 2014 Seasonal Update draft will be posted to the TMT website by the end of November.
- The final 2014 Water Management Plan will be posted by the end of the year.

Operation Review

Reservoirs – BOR reported on reservoir operations. Midnight elevations at Hungry Horse were 3,547.8ft, with 2.0 kcfs discharge. Grand Coulee midnight elevation was 1,286.6ft which is within +/-1ft from elevations during the week of October 21st. Based on current forecasts, there will be a slight draft at Grand Coulee to maintain the initial Bonneville tailwater operation for Chum spawning habitat.

COE reported on reservoir operations. Libby midnight elevation was at 2,452.4ft, with outflows of 4kcfs and inflows of 4kcfs. Midnight elevation at Albeni Falls was 2,053.2ft, with outflows of 29.4kcfs and inflows of 18.7kcfs. Dworshak midnight elevation was 1,518.9ft, with outflows of 1.7kcfs and inflows of 0.9kcfs. At Lower Granite inflows were 18.4kcfs; McNary inflows were 116.4kcfs and Bonneville inflows were 110.5kcfs.

COE updated the group on Lake Pend Oreille operations. The elevation of the lake is regulated by Albeni Falls and COE will draft to meet an elevation of 2,051 feet by November 10th and then hold for spawning. Albeni Falls releases stored in Grand Coulee may be shaped to aid in the management of the Bonneville Dam tailwater for the chum operation.

Fish – Paul Wagner reported that adult fall Chinook are trailing off, with 300-600 passing Bonneville per day for the last week. Fall Chinook jacks are trailing as well, with a total of 110,000 over Bonneville. This year fall Chinook were at 248% and jacks were at 181% of the 10-year average. At Lower Granite, 55,000 adult fall Chinook have passed, which is 300% of the 10-year average; 22,000 jacks have passed, which represent 157% of the 10-year average. At Bonneville, Steelhead are winding down with 64% of their 10-year average, wild steelhead are at 87% of the 10-year average. 101,000 Steelhead (and of that, 31,182 wild steelhead) have passed Lower Granite, which is 60% and 75% respectively of the 10-year average. Lamprey passage is done for the season, with a total around 24,000, or 70% of the 10-year average over Bonneville and 59% of the 10-year average over Lower Granite. It was noted that the numbers reported only include the window counts, and that traps and night counts show a solid 90,000+ lamprey run this year.

Juveniles have picked up in passage at Lower Granite with a record 1,200 per day for the last week. There was inquiry as to if flow changes or increases in stock from increased escapement is adding to the juveniles at Lower Granite. It was noted that PIT tags show that the fish are predominantly late, Clearwater stock.

Transportation Update

COE reported that there was an emergency release of truck fish at the McNary Dam on October 25th. The fish were intended to be released at Bonneville, however, due to vehicle complications the fish were released near McNary. FPOM members were informed of the emergency release via email on October 25th.

Water Quality – Laura Hamilton, COE, reported that there were 28 TDG exceedances in July and 19 in August. The July exceedances in the Snake system and at McNary were due to lack of load; the rest were due to best professional judgment. The August exceedances were largely attributed to the special operation at Lower Granite; additionally there were 2 exceedances at Bonneville due to a downed gauge at Cascade Island. The Portland District COE is preparing a statement of work for December or January to repair the gauge.

Power System – Nothing to report.

The next TMT meeting will be a conference call on November 6th from 9:00-12:00.

Agenda topics will include: Chum Update; Lamprey flume progress; Dworshak safety discussion; Water Management Plan 2nd Draft; and the TMT Year End Review Agenda.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

October 30, 2013
Minutes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BOR, BPA, NOAA, Idaho, Montana, Nez Perce Tribe, Washington, USFWS, Oregon, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review Meeting Minutes for September 18 and October 2

There were no comments today on the minutes or facilitator's notes for either of these meetings. They were deemed final unless future concerns are raised.

3. Chum Update

Chum have recently been reported spawning in Grays River, Paul Wagner, NOAA, reported. It's highly likely they're in the Ives Island area as well, although none have been surveyed there yet. If not already present, chum will likely arrive by this weekend, when rain is expected.

FPAC met yesterday and advised TMT to meet November 6 to determine whether the chum spawning operation should begin the next day. There was general agreement that would be a good time to start the chum operation, so it was scheduled tentatively to begin at 6 a.m. November 7. Consistent with previous year's operations the AAs will maintain a minimum 11.3 ft tailwater as a hard constraint and target 11.5 ft with a 0.4 ft operating range of 11.3 to 11.7 ft.

The lamprey flume repair at Bonneville is proceeding ahead of schedule, Baus reported. He will provide an update on the flume repair on the November 6 TMT conference call.

Charles Morrill, Washington, inquired about last year's alleged gill netting of chum salmon from Hamilton Springs and whether there will be measures to ensure it doesn't happen again this year. Tom Lorz, CRITFC, said tribal officers are aware of the incident that occurred last year and will monitor the area for illegal fishing.

4. Dworshak Operations Safety Concerns

Recently there was another incident of a steelhead angler getting caught on the gravel bar by an unexpected increase in Dworshak discharges, Russ Kiefer, Idaho, reported. According to Kiefer, at 10:30 a.m. on October 24, the Peck gage elevation rose by 0.5 to 0.7ft. within 15-20 minutes as a result of turbine testing at the project. This occurred at a time of year when anglers wouldn't expect the river to rise.

Baus said the appropriate Corps staff was not available to address this issue today but would likely be able to provide an update on the incident during the November 6 TMT meeting.

5. Preliminary Survival Estimates for 2013 Passage Season

Paul Wagner introduced a recent NOAA memo on preliminary survival estimates for 2013 (attached to today's agenda). Based on PIT-tag data, the memo gives estimated percent survival for this year's spring outmigrants along with average long-term survival rates over the past 13 years.

Table 4 shows that yearling chinook survival from Lower Granite to Bonneville was 61.9% in 2013, exceeding the long-term average survival rate of 53%. However, from the Snake River trap to Lower Granite, survival was lower this year at 84.5% than the long-term average of 94.0%. Russ Kiefer, Idaho, noted that a change in spill proportions can skew the survival estimates for individual reaches. From McNary to Bonneville, yearling chinook survival was higher than the long-term average, 79% this year vs. 70% long term.

Dave Statler, Nez Perce Tribe, asked whether there are survival targets for specific reaches. Survival targets are established for each project, Wagner said. Table 2 in the NOAA memo gives more detail on chinook survival rates in individual reaches: from the trap to Lower Granite, 84%; from Lower Granite to Little Goose, 92% (nearly the same as long-term average); from Little Goose to Lower Monumental, 98% (vs. 92% long term); from Lower Monumental to McNary, 90% (vs. 86% long term); from McNary to John Day, 94% (vs. 88% long-term). The main point here, Wagner said, is that lower than average 2013 survival rates from the Snake River trap to Lower Granite reduced the overall survival picture from Lower Granite down to Bonneville.

Steelhead survival from the trap to Lower Granite was in line with prior years at 97% this year vs. 96% long term. From Lower Granite to McNary, steelhead survival was 65%, which is close to the long term average of 63%. From McNary to Bonneville, survival was 80% vs. 66% over the long term, although survival rates have been higher than 66% in recent years. From Lower Granite to Bonneville, steelhead survival was 52% compared to 45% long-term (68% in 2009 and 60% for 2010-12).

As Table 3 shows, the McNary to John Day reach was the low point for steelhead survival this year at 80% – the same as last year's rate, but lower than recent years when survival was 95-98%. The McNary to John Day reach is problematic for steelhead, and lower survival rates in this reach depress the overall average (the rates for other reaches were all close to their long-term averages). The real problem here, however, is the McNary to John Day reach, where predation is a likely culprit. Tony Norris, BPA, noted that while 2012 and 2013 had the same survival rates, 2012 was a wet year and 2013 a dry one. Apparently, survival rates are not sensitive to flow rates.

In the Upper Columbia (Table 6), hatchery sockeye rates to McNary were 55%, in line with the long-term average. From McNary to John Day, survival was 96%; Wagner could not

explain the disparity in survival between the upper Columbia and Snake rivers. For Snake River sockeye this year, survival from Lower Granite to Bonneville was 53%, which exceeds the long-term average of 40%. From Rock Island to Bonneville (upper Columbia), survival was 48%, considerably lower than in 2012 and lower than the long-term average but in line with recent years.

Transport percentages this past year were on the low side: 36% for wild spring chinook salmon smolts and 31% for hatchery spring chinook smolts. The rates of steelhead transported were 40% and 35% for wild and hatchery smolts, respectively which is in line with rates in recent years but less than six years ago, when the transport rate was 80%. Wagner noted that flows were low in the Snake this year, with an average flow of 68% kcfs during spring season. That's only 80% of typical flows.

A more detailed report of 2013 survival rates for various species and reaches will be presented at the TMT year-end review December 12.

6. Water Management Plan

The first draft of the 2014 WMP is posted to the TMT website, Baus said. Comments, which are due October 31, should be sent to all three Action Agencies. The revised draft will be posted to the TMT site during the first week of November, with comments due November 15. The final draft will be posted November 28, and the seasonal update draft will also be posted at the end of November. The final WMP for 2014 will be available by the end of this year. Baus said the 2013 seasonal update is also posted; feedback on that is welcome as well.

7. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3547.8 feet, with inflows of 500 cfs and releases of 3.5 kcfs to meet Columbia Falls minimums. Grand Coulee is at elevation 1286.6 feet, where it has remained the past few weeks in preparation for the start of chum flows November 7. Based on the current STP forecast, there will be a slight draft of Coulee to maintain the initial chum spawning level below Bonneville.

Libby is at elevation 2452.4 feet, with average inflows of 4.0 kcfs and releases of 4.0 kcfs. Albeni Falls is at elevation 2053.2 feet, drafting to meet the minimum control elevation of 2051 feet by November 10. This year there is more flexibility to go above the minimum control elevation to keep kokanee redds watered, Kiefer said. Average ALF inflows are 18.7 kcfs and releases are 29.4 kcfs. Dworshak is at elevation 1518.9 feet, with average inflows of 0.9 kcfs and releases of 1.7 kcfs.

Lower Granite daily average inflows are 18.4 kcfs. McNary daily average inflows are 116.4 kcfs. Bonneville daily average inflows are 110.5 kcfs.

b. Fish. Adults: Fall chinook passage has declined to about 600 per day for the past week, with a total of just under 950,000 fish for the season. This is a record-setting 245% of

the 10-year average. Fall chinook jacks are arriving at a rate of 50-100 per day, with a seasonal count of 110,000 to date – 181% of the 10-year average. Steelhead passage is winding down, with a total of around 233,000 fish to date; the wild steelhead count to date is 99,000. Steelhead adult passage overall is 64% of the 10-year average; for wild steelhead, it's 80% of the 10-year average.

Lamprey passage is finished, with a total count of almost 24,000 lamprey. This is only the daytime window count, which doesn't account for better passage routes developed in recent years, Statler said. The actual adult lamprey count is closer to 90,000. While the total lamprey count this year was one of the best in recent years, this is not reflected in the numbers from Lower Granite, where night counts still need to be added.

At Lower Granite, the fall chinook adult count is 55,700 to date, which is nearly 300% of the 10-year average, Wagner said. For fall chinook jacks at Granite, the count to date is 22,000, which is 157% of the 10-year average. For steelhead, the count to date is 101,000, which is 60% of the 10-year average (the wild steelhead count is 31,182, about 75% of the 10-year average). In general, wild runs arriving at Bonneville are stronger this year, but still below the 10-year average.

Juveniles: More than 1200 juveniles passed Lower Granite for about a week, which set a record, Wagner reported. Kiefer wondered whether this was the result of flow temperature changes or just increasing numbers of juveniles being produced from increased adult escapements over the past several years.

Transportation Update: On October 25 at approximately 5 pm, there was an emergency release of trucked fish at McNary due to an oil leakage from the fish trailer, Baus reported. The 1,331 juveniles in the truck (including 1319 unclipped subyearling chinook, 8 clipped subyearling chinook, and 4 unclipped sockeye) were released into the McNary outfall bypass. FPOM was notified of the emergency release prior to today's TMT meeting.

c. Water Quality. Laura Hamilton, COE, reported. There were 28 TDG instances in July, mostly in the first 5-6 days of the month (6 at LGS, 6 at ICR, 4 at MCN, 3 at JDA, 1 at TDA, 2 at BON forebay, and 2 at Camas Washougal gage). All of the July TDG instances on the Snake River were attributed to lack of load. The rest (a total of 28) were attributed to best professional judgment in setting the spill caps.

In August, there were a total of 19 TDG instances. Of these, 9 were attributed to special operations and 3 to best professional judgment. All of the TDG instances at Lower Granite from August 11-16 were attributed to the special operations at Lower Granite this year. Two of the TDG instances at BON tailwater were attributed to the outage of Cascade Island gage. Hopefully the Cascade Island gage can be repaired in December, or at least by January.

d. Power System. There was nothing to report.

7. Next TMT Meeting

The next TMT meeting will be a conference call November 6 to discuss chum spawning, the lamprey flume repair, and the Dworshak safety issue for anglers.

<i>Name</i>	<i>Affiliation</i>
Lisa Wright	COE
Doug Baus	COE
John Roache	BOR
Tony Norris	BPA
Paul Wagner	NOAA
Russ Kiefer	Idaho
Jim Litchfield	Montana
Scott Bettin	BPA
Dave Statler	Nez Perce
Charles Morrill	Washington
David Wills	USFWS
Erick Van Dyke	Oregon
Emily Plummer	DS Consulting
Mitch Green	BPA intern

Phone:

Bruce McKay	consultant
Laura Hamilton	COE
Heather Dohan	Puget
Don Tinker	SCL
Agnes Lut	BPA
Mike Shafley	Snohomish
Margaret Filardo	FPC
Barry Espenson	CBB
Greg Lawson	Thompson Reuters
Richelle Beck	Grant PUD
Tom Lorz	CRITFC
Pete Lyman	PGE

TECHNICAL MANAGEMENT TEAM

COE:	<i>Doug Baus / Karl Kanbergs</i>	BPA:	<i>Tony Norris / Scott Bettin / Robyn MacKay</i>
BOR:	<i>John Roache / Mary Mellema</i>		
NOAA:	<i>Paul Wagner / Richard Domingue</i>	USFWS:	<i>David Wills / Steve Haeseker</i>
OR:	<i>Erick Van Dyke</i>	ID:	<i>Russ Kiefer / Pete Hassemer</i>
WA:	<i>Charles Morrill</i>	MT:	<i>Jim Litchfield / Brian Marotz</i>
Kootenai:	<i>Sue Ireland / Billy Barquin</i>	Spokane:	<i>Andy Miller</i>
Colville:	<i>Sheri Sears / Keith Wolf</i>	Nez Perce:	<i>Dave Statler</i>
Umatilla:	<i>Tom Lorz (CRITFC)</i>	Salish-Kootenai:	<i>Stu Levit</i>

TMT CONFERENCE CALL

Wednesday, November 6, 2013 9:00 am - 12:00 pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6394

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Please e-mail her at rgumpert@cnmv.net or call her at (503) 248-4703.*

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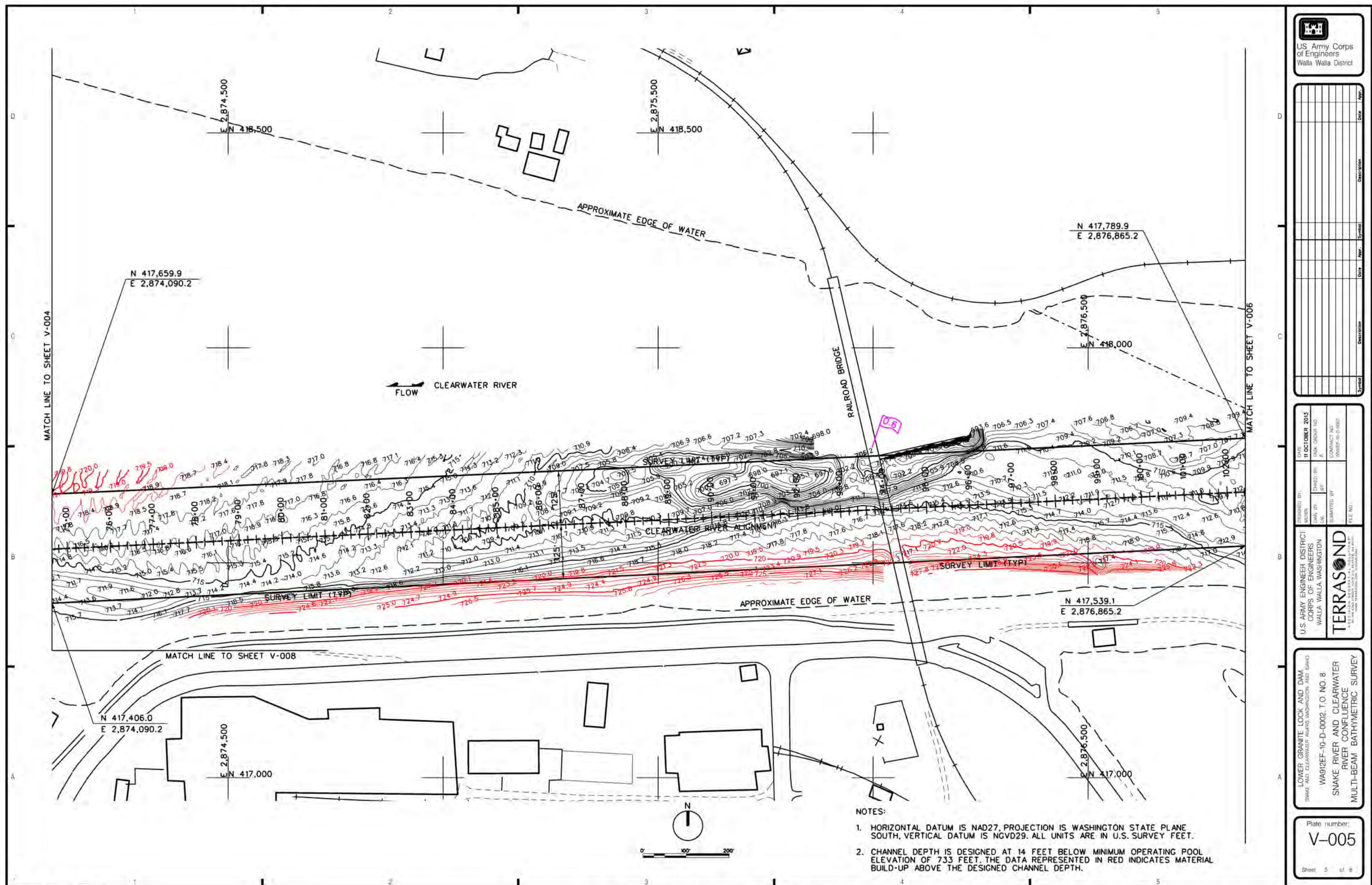
AGENDA

1. Welcome and Introductions
2. Dworshak Operations - Steve Hall - COE-NWW
3. Snake Confluence (Lewiston) Surveys - Steve Hall - COE-NWW
 - a. [Data](#)
4. Chum Update - Charles Morrill - WDFW, and Doug Baus - COE-NWD
5. TMT Year End Review Agenda - Robin Gumpert - DS Consulting
6. Other
 - a. Set agenda and date for next meeting - **November 20, 2013**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

Doug Baus - (503) 808-3995



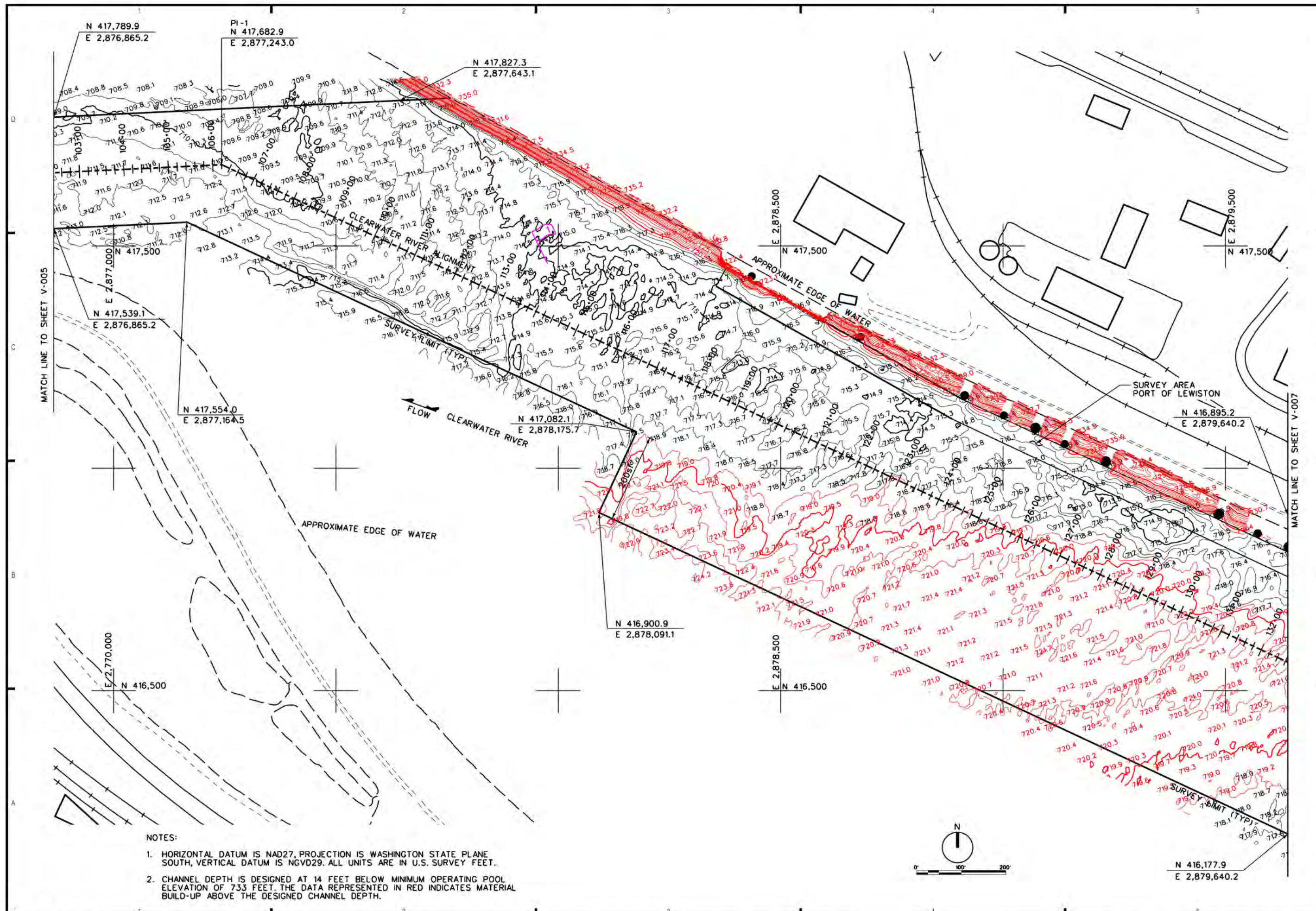
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WA912EF-10-D-0002, T.O. NO. 8
 SNAKE RIVER AND CLEARWATER
 RIVER CONFLUENCE
 MULTI-BEAM BATHYMETRIC SURVEY

Plate number:
V-005



- NOTES:
1. HORIZONTAL DATUM IS NAD27, PROJECTION IS WASHINGTON STATE PLANE SOUTH, VERTICAL DATUM IS NGVD29. ALL UNITS ARE IN U.S. SURVEY FEET.
 2. CHANNEL DEPTH IS DESIGNED AT 14 FEET BELOW MINIMUM OPERATING POOL ELEVATION OF 733 FEET. THE DATA REPRESENTED IN RED INDICATES MATERIAL BUILD-UP ABOVE THE DESIGNED CHANNEL DEPTH.

US Army Corps of Engineers
Walla Walla District

Date	Author	Checked By	Drawn By	Submitted By	File No.
11 OCTOBER 2013					

RESUBMITTED BY: [blank]

DESIGNED BY: [blank]

DRAWN BY: [blank]

CHECKED BY: [blank]

DATE: 11 OCTOBER 2013

CONTRACT NO. WAFCE-10-D-0002

WAFCE-10-D-0002

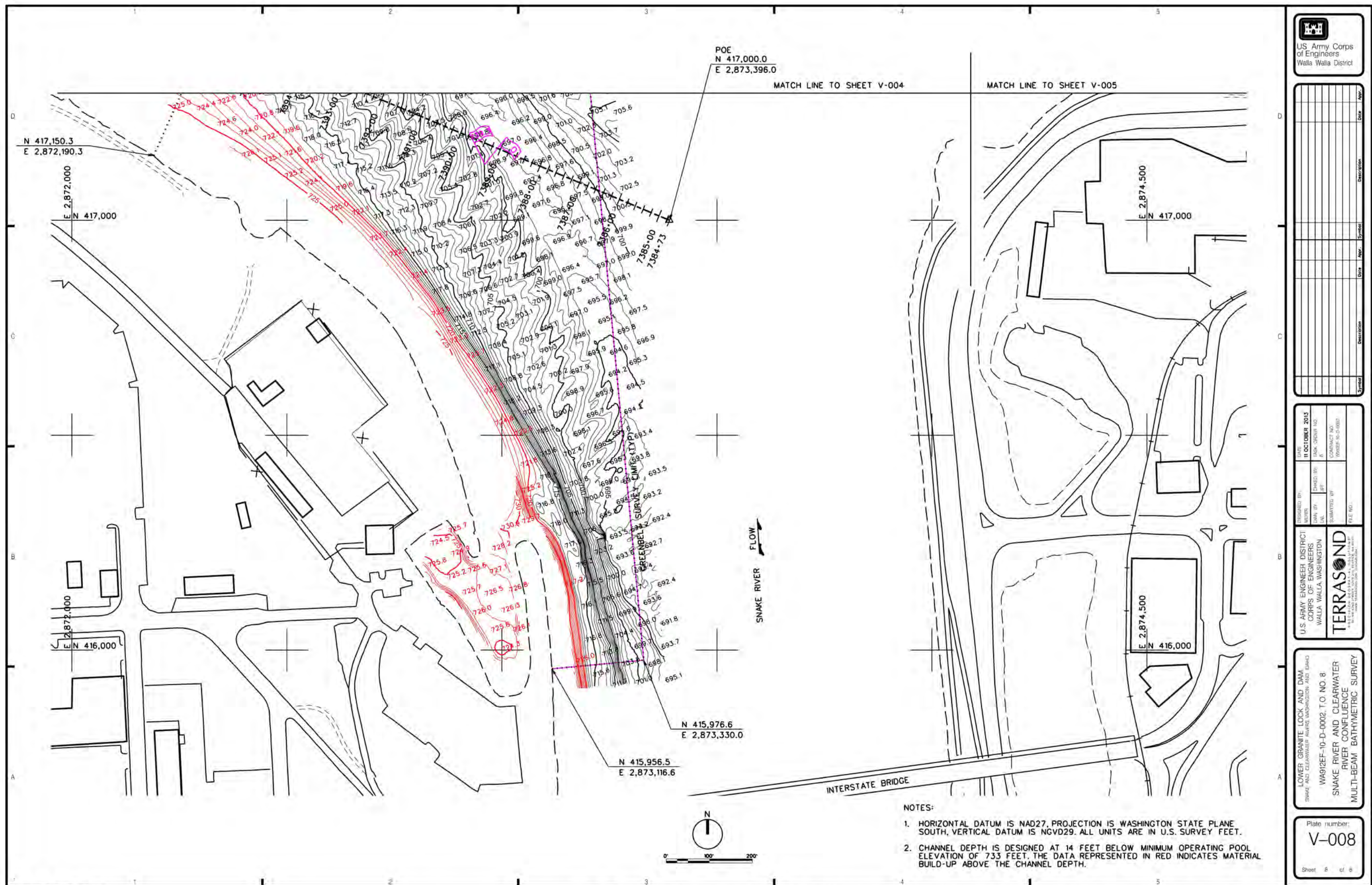
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WALLA WALLA WASHINGTON

TERRASO
ENGINEERING & CONSTRUCTION, LLC
1000 N. 1ST AVE. SUITE 200
WALLA WALLA, WA 99055-1000
TEL: 509.565.1234 FAX: 509.565.1235

LOWER GRANITE LOCK AND DAM
SNAKE AND CLEARWATER RIVERS WASHINGTON AND IDAHO
WAFCE-10-D-0002, T.O. NO. 8
SNAKE RIVER AND CLEARWATER
RIVER CONFLUENCE
MULTI-BEAM BATHYMETRIC SURVEY

Plate number:
V-006

Sheet 6 of 8



COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

November 6, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Dworshak Operations Safety Concerns

As follow up to the previous TMT meeting at which Russ Kiefer, Idaho, raised a concern for angler safety based on a reported incident in October, Steve Hall, COE Walla Walla, reported that annual turbine maintenance at Dworshak was conducted as planned and testing of Unit 3 occurred on 10/24. Due to feedback from last year's operation, the ramping levels were slowed and additional notification measures were put into place. An auto notification process was set up for both the COE and IDFG Public Affairs Offices, however, it was recently discovered that the emails were not being received. As a result, Steve Hall and Russ Kiefer are working together to improve the notification process put in place last year. Although still in progress, the following steps have been identified thus far:

- COE Walla Walla staff and IDFG will put new protocols in place for the Public Affairs offices to notify COE Walla Walla if notifications are not received.
- Create standard language that can be added to IDFG announcements to include in news releases to inform anglers of unit outages that could create water level fluctuations as well as the potential for unplanned fluctuations in water elevations – and that anglers should always use caution.
- Add the annual maintenance and outage schedule at Dworshak as a reoccurring TMT agenda item in mid-September.
- Ensure that both COE and IDFG Public Affairs offices are aware of the unit testing that will occur on November 14 or 15 and December 19 or 20 this year when Units 1 and 2, respectively, are tested prior to being returned to service.

Snake Confluence (Lewiston) Survey

Steve Hall reported that the results of the latest bathymetry Snake River Confluence surveys look very similar to last year's sediment distribution in the channel. There were no significant changes in the amount of sediment or where it is accumulating; it was suggested that this could be due to the low flow year. As a result, the Corps plans to operate Lower Granite in 2014 within the same variable MOP operation as was implemented in 2013, up to MOP +2 depending on inflows and lower pool elevations during high flows for flood control.

There was inquiry as to the expected timeframe for dredging per the Programmatic Sediment Management Plan and forthcoming EIS. Steve Hall reminded the group that earlier this year there was public review of the EIS, however, there were delays in the EIS process that delayed the signing of the Record of Decision (ROD) in time to schedule dredging for this winter. Thus, no in-water work will be conducted this winter. Steve reported the current schedule is to release the Final EIS for public comment in Spring 2014 followed by a ROD in Summer 2014, so the soonest dredging will occur is during the next available in-water work window in 2014/2015. For more information on the PSMP and EIS, and to sign up for email updates, Hall pointed the group to the NWW PSMP website at: <http://www.nww.usace.army.mil/>

There was inquiry as to if higher flows would decrease the amount of sediment accumulating. Steve Hall replied that high flows would not likely decrease the sediment, just rearrange it. The free-flowing tributaries that feed

into the Lower Granite pool transport sediment which is then dropped when it meets the slack water in the pool.

An update on the progress of the EIS and ROD will be provided at a February 2014 TMT Business meeting.

Chum Update

Charles Morrill (WDFW) reported that Chum have passed Bonneville and were noted in the Ives, Horseshoe, Multnomah, Hamilton Creek and Hamilton Springs areas. Doug Baus, COE, noted that although the Bonneville tailwater operation to support chum will not officially be implemented until November 7th, the Bonneville tailwater is currently within the chum operating elevation range due to higher flow conditions. FPAC expressed appreciation to the Action Agencies for implementing the operation. A teletype will be issued today (11/6) to 'officially' implement the operation starting at 0600 on November 7th.

An update on the Chum operation will be provided at the November 20th TMT Business meeting.

Year End Review

Robin Gumpert, Facilitator, noted that TMT members are currently working to craft the Year End Review (YER) agenda. The agenda will be finalized and posted after the November 20th TMT meeting. Please make note that the YER will take place on Thursday, December 12th, from 10:00-3:00 at the Ambridge Center in Portland.

Water Management Plan

Doug Baus, COE, thanked TMT members for suggested edits to the first draft of the Water Management Plan. The comments are on the TMT website and the next draft will be posted by November 8th. TMT member comments on the second draft are due by November 15th.

The next TMT meeting will be a face to face on November 20th from 9:00-12:00 at the normal meeting location in the COE Division Building.

Agenda topics will include: Chum Update; Water Management Plan 2nd Draft and Operations Review.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

November 6, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of NOAA, Montana, Washington, BPA, BOR, CRITFC, Oregon, Idaho, the Colville Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Dworshak Operations Safety Concerns

Steve Hall, COE, gave an explanation for the recent stranding of an angler by an unexpected rise in river elevation below Dworshak Dam. Every year, Dworshak has routine unit testing; this year unit 3 had to be brought up to full load for an hour or two as part of the test. The ramp-up occurred from approximately 10:30 a.m. to noon on October 24, and was implemented so as to maintain changes in water elevation within ramp rate criteria.

Unfortunately, automatic email notification of COE and IDFG public affairs offices did not occur this time, as it has in the past. Hall and Russ Kiefer, Idaho, have been working together to develop a more reliable system for notifying the public when changes in river elevations due to unit testing are scheduled to occur. Testing will occur again on November 14 or 15, then again on December 19 or 20, when Units 1 and 2, respectively, are tested prior to returning to service. Hall also suggested that TMT have a standing agenda item in September to discuss the unit testing schedule at Dworshak as part of planning for summer flow augmentation.

3. Snake River Confluence Survey Data

Hall showed TMT recent survey data sheets from the Snake-Clearwater River confluence area, linked to this item on today's agenda. Surveys of the area show there has been little sediment accumulation since last year. That is to be expected because 2013 was a dry year.

Therefore, in 2014 the Corps is planning on implementing the same variable MOP+2 operation that occurred in 2013. The variable MOP operation is needed to meet flood control requirements at high flows. Release of the final EIS is expected in spring 2014, with a ROD in the summer of 2014. The earliest that dredging could occur is the in-water work window of fall 2014-winter 2015.

Sheri Sears, Colville Tribe, asked whether higher flows can result in decreased sediment. As flows reach the slackwater at the confluence, velocities tend to drop and the sediment in them settles, Hall said. Because 2013 was a low flow year, not much sediment has accumulated.

More information on the Programmatic Sediment Management Plan is available on the COE Walla Walla website. Hall will notify TMT when the comment period opens on the final PSMP EIS next spring.

4. Chum Update

Chum are present in the Ives Island area, Charles Morrill, Washington, said. It's likely they are spawning in Hamilton Springs and Hamilton Creek as well. At last week's TMT meeting, there was agreement to begin the Bonneville tailwater operation for chum on November 7. As in previous years, the operation will consist of a minimum Bonneville tailwater elevation of 11.3 feet during all hours, with a hard constraint of 11.3-11.7 feet, targeting 11.5 feet, from 6:30 am to 5 pm. Current Bonneville tailwater elevation is 11.4 feet; the operation officially begins tomorrow at 6 am. TMT will discuss chum spawning at its next meeting in person November 20.

5. 2014 Water Management Plan

The next draft of the 2014 WMP will be posted to the TMT page on November 8, Baus said. TMT members are encouraged to review the draft and comment.

6. TMT Year End Review Agenda

The TMT year end review will be held on December 12 at the Ambridge Center in Portland, the same location as last year.

7. Next TMT Meeting

The next TMT meeting will be November 20.

<i>Name</i>	<i>Affiliation</i>
Paul Wagner	NOAA
Jim Litchfield	Montana
Charles Morrill	Washington
Scott Bettin	BPA
John Roache	BOR
Tom Lorz	CRITFC/Umatilla
Doug Baus	COE RCC
Lisa Wright	COE RCC
Erick Van Dyke	Oregon
Steve Hall	COE NWW
Don Tinker	SCL
Heather Dohan	Puget
Shane Scott	PPC
Barry Espenson	CBB
Laura Hamilton	COE RCC

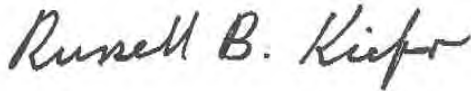
Karl Kanbergs
Margaret Filardo
Bruce McKay
Sherry XX
Russ Kiefer
Sheri Sears
Richelle Beck

COE RCC
FPC
consultant
XX Energy
Idaho
Colville Tribe
Grant PUD

SYSTEM OPERATIONAL REQUEST: #2005-22

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: U.S. Fish & Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, the Washington Department of Fish and Wildlife, NOAA Fisheries, Nez Perce Tribe, Shoshone-Bannock Tribes, and the Columbia River Inter-Tribal Fish Commission.

TO:	Colonel Gregg F. Martin	COE-NWD
	James D. Barton	COE-Water Management
	Cathy Hlebechuk	COE-RCC
	Witt Anderson	COE-P
	Col. Thomas E. O'Donovan	COE-Portland District
	LTC Randy L. Glaeser	COE-Walla Walla District
	J. William McDonald	USBR-Boise Regional Director
	Stephen J. Wright	BPA-Administrator
	Greg Delwiche	BPA-PG-5



FROM: Russ Kiefer, Chairperson, Salmon Managers

DATE: December 6, 2005

SUBJECT: Snake River Zero Nighttime and Weekend Flow

SPECIFICATIONS:

The fishery agencies and tribes recommend following the guidelines they developed in 2003 regarding the implementation of zero flow at Snake River projects.

JUSTIFICATION:

The COE LWG water Control Manual states on page 8-2,

“From December to February, “zero” minimum project discharge is permitted on a limited basis. Under an agreement between the Corps of Engineers and the fishery agencies, zero river flow is allowed for water storage during low power demand periods (at night and on weekends) when there are few, if any, actively migrating anadromous fish present in the Snake River... Water stored under zero river flow conditions may maximize power production from the Columbia River basin system, but zero river flow operations are not recommended at Lower Granite when fish are actively migrating in the Snake River.”

In the Winter 2003/2004, the Salmon Managers proposed the following criteria to define what is meant by “few” migrating adults.

1. The number of adults migrating per day is defined as the number of upstream counts minus the number of downstream counts.
2. A three-day moving average will be used to determine if the few migrating adult criterion has been met.
3. “Wild” and “total” returns will be calculated separately. Only one of the categories is necessary to show that more than a few adults are migrating.
4. The run to date is defined as the cumulative number of adult steelhead in the “wild” and “total” categories passing Lower Granite Dam since June 1st of the return year.

The few migrating adult criterion trigger will be defined on a sliding scale outlined in the following table. The table applies to both “wild” and “total” categories of returning adult steelhead.

Run to date>#	Run to date≤ #	Few criteria< #
0	30,000	10
30,000	60,000	20
60,000	100,000	35
100,000	150,000	50
150,000	200,000	65
200,000	250,000	80
250,000		100

As of December 2, 2005, 149,490 total steelhead and 34,220 wild steelhead had passed Lower Granite Dam since June 1, 2005. Using the above table proposed by the Salmon Managers, “few” fish would be defined as less than 50 fish over a three day moving average using the total steelhead number and less than 20 fish using the wild steelhead number. The three-day average total steelhead count at Lower Granite over 11/3, 12/1, and 12/2 was 82 fish and the wild fish three-day average was 25 fish. In either case, the three-day average of fish exceeds the definition of “few” and the salmon managers would not recommend operating to zero nighttime or weekend flow. The salmon managers recommend using the proposed criterion for implementing zero nighttime and weekend flow this year.

TECHNICAL MANAGEMENT TEAM

NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)		
BOR:	John Roache / Mary Mellema	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
COE:	Doug Baus / Karl Kanbergs		

TMT MEETING

Wednesday November 20, 2013 9:00am - 12:00pm

**1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)**

**Audio Conference
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6071**

**Web Meeting
Web Meeting Address <https://www.webmeeting.att.com>
Meeting Number (877)336-1274
Access Code 3871669**

*** The first time you use the Web Meeting Service, you will need to download the client software.
Web Meeting HELP & Software Downloads can be found at: <https://www.webmeeting.att.com>**

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information re: discussions and decisions made at TMT. Operational decisions that are made outside a TMT meeting will be reported on at the next scheduled meeting and/or linked to the agenda item of the meeting at which it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes - [November 7](#)

3. Chum Update - *Charles Morrill - WDFW, and Doug Baus - COE-NWD*
4. Water Management Plan - *Doug Baus - COE-NWD*
5. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
6. Other
 - a. Set agenda and date for next meeting - **December 4, 2013**
 - b. [\[Calendar 2013\]](#)

Questions about the meeting may be referred to:
[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

November 20, 2013

DRAFT Facilitator's Summary

Facilitator: Robin Gumpert, DS Consulting; Facilitation Support: Emily Plummer, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Update on Web-Conference

For this meeting, TMT is testing ATT Web Meeting, which allows distant attendees to log-in and track documents and presentations viewed during the meeting. TMT is trying out this technology to see if it is a helpful tool to utilize for TMT meetings in the future. Please provide any feedback on the format to DS Consulting or to Doug Baus.

Review of Minutes

The official TMT minutes and Facilitator's Summary for the November 6th meeting were posted, reviewed by TMT members and approved.

Chum Update

Charles Morrill (Washington) reported that flow conditions have not been favorable for surveying Chum, in the Grays River area, however, the run is underway and at this point, it appears that numbers are average to below average. Survey data for this week (11/19) was not yet available. There are 112 Chum reported to have passed Bonneville as of 11/19 and Tony Norris (BPA) shared that he saw approximately 25 pairs spawning in the Hamilton Springs and Hamilton Creek area. Doug Baus, COE, reported that the Bonneville tailwater operation is underway, targeting 11.5ft, with a range of 11.3-11.7ft. Currently, the Bonneville tailwater elevation is at 11.6ft.

An update on the Chum operation will be provided at the December 4th TMT Business meeting (conference call).

Water Management Plan

Doug Baus, COE, thanked TMT members for their comments on the first and second drafts of the WMP and reported that comments received are posted on the TMT website and will be considered for incorporation into the final Plan. COE is reviewing the comments internally; comments will be reviewed by COE legal and policy staff. It was noted that this is a working document, so TMT Members are able to comment at any time. However, the final draft will be posted on December 31st, thus, due to timing of legal and policy review, comments submitted past the 11/15 deadline may not be reflected in the final version.

The TMT Members expressed appreciation to Doug Baus for providing them with a document showing changes made between the two drafts of the Water Management Plan.

Operation Review

Reservoirs – John Roache, BOR, reported on reservoir operations. Midnight elevations at Hungry Horse were 3,545.9ft, with 1.8 kcfs discharge. There is a slight draft at Hungry Horse to meet the minimum flow requirement needed at Columbia Falls. Grand Coulee midnight elevation was 1,283.1ft, with a slight draft to meet Bonneville tailwater elevations for Chum.

Lisa Wright, COE, reported on reservoir operations. Libby midnight elevation was at 2,444ft, with outflows of 25kcfs and inflows of 7.1kcfs. Midnight elevation at Albeni Falls was 2,051ft, with outflows of 16.1kcfs and

inflows of 10.4kcfs. Dworshak midnight elevation was 1,519.6ft, with outflows of 1.7kcfs and inflows of 2.7kcfs. Lower Granite day average inflows were 19.6kcfs; McNary inflows were 108.1kcfs and Bonneville inflows were 112.9kcfs.

Fish – Paul Wagner, NOAA, noted that Chum are entering the system and there will be more to report in the coming weeks. There are no significant updates on fall fish counts; however, Paul reviewed the numbers to date. Adult fall Chinook are trailing off, with low double digits passing Bonneville per day for the past few days. This year over 950,000 passed Bonneville, this is 246% of the 10-year average. Fall Chinook jacks are trailing as well, with a total of 110,000 over Bonneville, 181% of the 10-year average. This suggests that next year might be another big run. Just under 24,000 lamprey have passed Bonneville, representing 70% of the 10-year average. At Lower Granite, over 56,000 adult fall Chinook have passed, which is 299% of the 10-year average; over 22,000 jacks have passed, which represent 158% of the 10-year average. At Bonneville, 233,000 Steelhead passed; representing 64% of their 10-year average. Wild steelhead are at 89% of the 10-year average. 106,000 Steelhead (and of that, 33,000 wild steelhead) have passed Lower Granite, which is 60% and 76% respectively of the 10-year average.

The following comments were made by TMT members:

- The 10-year averages for lamprey only include day time counts and not night time counts; thus these percentages are not inclusive.
- There is a little disparity between Bonneville and Lower Granite Steelhead and wild Steelhead counts.
- Fall Chinook were seen spawning upstream of Lower Granite in Hells Canyon. It was noted that because fish are passing Lower Granite, operations upstream have to continue to support those fish, for instance, current operations at Idaho Power are providing coverage for spawning habitat.
- Fall Chinook counts above Priest Rapids were high; fish were noted to have passed above Wanapum and are likely using the Lower Wenatchee or Lower Entiat Rivers.

Paul also noted that the Zero Night Time Flow operation for Lower Granite is approaching, depending on the numbers of Steelhead. A table detailing the criteria is available in SOR #2005-22. TMT will revisit the Zero Night Time Flow operation at the December 4th meeting.

Water Quality – Laura Hamilton, COE, reported on water quality. Laura reported that there was spill at McNary Dam at the end of October and the first of November. Laura updated TMT on the status of the Cascade Island gauge, reporting that the statement of work is still being drafted and they are hoping to get the in-water work done before next spill season, ideally, by February 2014. COE is working to identify how to best repair the gauge so that strong flows do not knock it out again. The Warrendale gauge can be used in place of the Cascade Island gauge if needed.

Power System – Nothing to report.

Year End Review

Robin Gumpert, Facilitator, noted that TMT members are currently working to revise the Year End Review (YER) agenda; it will be finalized and posted by the end of the week (11/22). The YER will take place on Thursday, December 12th, from 9:00-3:30 at the Ambridge Center in Portland (please note the time change from the 11/6 Facilitator's Summary). Instructions for RSVP will be provided shortly.

The next TMT meeting will be a conference call on December 4th from 9:00-12:00. There will not be a meeting on 12/11.

Agenda topics will include: Chum Update; Zero Night Time Flow and Operations Review.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

November 20, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, Nez Perce Tribe, Oregon, Idaho, Washington, USFWS, Montana, Colville Tribe, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review Meeting Minutes for November 6

There were no comments today on the minutes or facilitator's notes for November 6 so they were deemed final unless future concerns are raised.

3. Chum Update

Paul Wagner, NOAA, reported that chum are present in the Ives Island area. As of yesterday, 112 chum have passed Bonneville Dam. More information on chum surveys is available on the NOAA Fish Passage Center website. Tony Norris, BPA, reported seeing approximately 25 pairs of spawned-out chum at Hamilton Springs on November 17.

The COE is maintaining the chum operation, keeping the Bonneville tailwater elevation between 11.3-11.7 feet and targeting 11.5 feet during daylight hours, Baus reported. Current tailwater elevation is 11.6 feet. TMT will revisit the chum operation at its next meeting December 4.

4. Water Management Plan

All comments on the 2014 WMP which the COE has received to date will be considered for the final document to be posted no later than December 31, Baus said. All comments are available on the TMT website.

Dave Statler, Nez Perce Tribe, asked whether comments on draft 2 of the WMP would be accepted after the November 15 deadline coordinated with the TMT. Baus and Norris agreed that comments on the WMP could be considered at any time, but it becomes difficult to incorporate changes after November 15 because the document will be under review by AA legal and policy staff.

5. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3545.9 feet, drafting 1.8 kcfs in order to meet Columbia Falls minimum flows. Grand Coulee is at elevation 1283.1 feet, currently

operating to meet the Bonneville tailwater requirements for chum. There is a slight draft of 2-2.5 feet per week to meet these requirements.

Libby is at elevation 2444 feet, with average inflows of 7.1 kcfs and releases of 25 kcfs. Albeni Falls is at elevation 2051 feet, with average inflows of 10.4 kcfs and releases of 16.1 kcfs. Dworshak is at elevation 1519.6 feet, with inflows of 2.7 kcfs and releases of 1.7 kcfs.

Lower Granite daily average inflows are 19.6 kcfs. McNary daily average inflows are 108.1 kcfs. Bonneville daily average inflows are 112.9 kcfs.

b. Fish. Adults: Paul Wagner, NOAA, closed out this year's fish reports with an update on the near-final passage counts for the runs. At Bonneville, fall chinook passage is down to 32 fish per day for the past few days. The season total for fall chinook at Bonneville is 950,000 – a huge number, 246% of the 10 year average. The fall chinook jack count of 110,000 is 182% of the 10 year average, which augurs for a strong run next year. Steelhead counts to date are 233,000, or 64% of the 10 year average. The wild steelhead count of almost 100,000 is 89% of the 10 year average. Lamprey passage (based on day counts only) is 24,000 to date. Wagner pointed out that the 10 year average for lamprey is only based on daytime counts.

Fall chinook passage at Lower Granite is 56,000 to date, which is a record-setting 299% of the 10 year average for that project. The jack count of 22,000 was 158% of the 10 year average.

Steelhead passage at Granite to date is 106,000, which is 60% of the 10 year average. Wild or unclipped steelhead are 33,000 to date, 76% of the 10 year average. There is a slight disparity between the counts at Lower Granite and Bonneville in terms of percentages that were wild or unclipped.

It was noted that current steelhead counts are approaching the criteria for zero nighttime flows on the Lower Snake River. These criteria were introduced in a 2005 SOR and are indexed to season counts to date. Russ Kiefer, Idaho, pointed out that current counts are close to the cutoff point for the 50 fish total or 20 unmarked criteria. Statler added that a run of smaller fall chinook have been spawning in significant numbers in a shallow area below the Hells Canyon Complex. TMT will revisit the criteria for zero nighttime flows at its next meeting December 4.

c. Water Quality. Laura Hamilton, COE, reported. There was spill in late October and early November, but there has been no spill since then. The Portland District has been working on getting the Cascade Island gage repaired before 2014 spill season. Because the gage has already been destroyed twice, the COE is identifying alternatives to prevent it from being destroyed a third time. There was mention of how Washington and Oregon differ in their calculations of TDG exceedances. Tom Lorz, CRITFC, asked what the plan is in terms of Camas Washougal gage. It is not included in TDG waivers for either state, so the COE is not legally required to use Camas Washougal gage under state law, Hamilton replied but we are required to use it as part of the court ordered roll over of the spill program.

d. Power System. There was nothing to report.

7. Next TMT Meeting

The next TMT meeting will be a conference call December 4 to discuss the chum operation and zero nighttime flows on the lower Snake River.

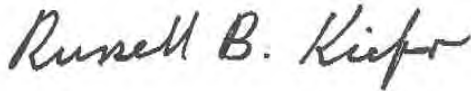
<i>Name</i>	<i>Affiliation</i>
Paul Wagner	NOAA
Dave Statler	Nez Perce
John Roache	BOR
Tony Norris	BPA
Lisa Wright	COE
Doug Baus	COE
Laura Hamilton	COE
Erick Van Dyke	Oregon
Russ Kiefer	Idaho
Emily Plummer	DS Consulting

<i>Phone:</i>	
Charles Morrill	Washington
David Wills	USFWS
Jim Litchfield	Montana
Heather Dohan	Puget
Shane Scott	PPC
Dave Benner	FPC
Brendan Taylor	Puget
Don Tinker	SCL
Keith Wolf	Colville Tribe
Tom Lorz	CRITFC

SYSTEM OPERATIONAL REQUEST: #2005-22

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: U.S. Fish & Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, the Washington Department of Fish and Wildlife, NOAA Fisheries, Nez Perce Tribe, Shoshone-Bannock Tribes, and the Columbia River Inter-Tribal Fish Commission.

TO:	Colonel Gregg F. Martin	COE-NWD
	James D. Barton	COE-Water Management
	Cathy Hlebechuk	COE-RCC
	Witt Anderson	COE-P
	Col. Thomas E. O'Donovan	COE-Portland District
	LTC Randy L. Glaeser	COE-Walla Walla District
	J. William McDonald	USBR-Boise Regional Director
	Stephen J. Wright	BPA-Administrator
	Greg Delwiche	BPA-PG-5



FROM: Russ Kiefer, Chairperson, Salmon Managers

DATE: December 6, 2005

SUBJECT: Snake River Zero Nighttime and Weekend Flow

SPECIFICATIONS:

The fishery agencies and tribes recommend following the guidelines they developed in 2003 regarding the implementation of zero flow at Snake River projects.

JUSTIFICATION:

The COE LWG water Control Manual states on page 8-2,

“From December to February, “zero” minimum project discharge is permitted on a limited basis. Under an agreement between the Corps of Engineers and the fishery agencies, zero river flow is allowed for water storage during low power demand periods (at night and on weekends) when there are few, if any, actively migrating anadromous fish present in the Snake River... Water stored under zero river flow conditions may maximize power production from the Columbia River basin system, but zero river flow operations are not recommended at Lower Granite when fish are actively migrating in the Snake River.”

In the Winter 2003/2004, the Salmon Managers proposed the following criteria to define what is meant by “few” migrating adults.

1. The number of adults migrating per day is defined as the number of upstream counts minus the number of downstream counts.
2. A three-day moving average will be used to determine if the few migrating adult criterion has been met.
3. “Wild” and “total” returns will be calculated separately. Only one of the categories is necessary to show that more than a few adults are migrating.
4. The run to date is defined as the cumulative number of adult steelhead in the “wild” and “total” categories passing Lower Granite Dam since June 1st of the return year.

The few migrating adult criterion trigger will be defined on a sliding scale outlined in the following table. The table applies to both “wild” and “total” categories of returning adult steelhead.

Run to date>#	Run to date≤ #	Few criteria< #
0	30,000	10
30,000	60,000	20
60,000	100,000	35
100,000	150,000	50
150,000	200,000	65
200,000	250,000	80
250,000		100

As of December 2, 2005, 149,490 total steelhead and 34,220 wild steelhead had passed Lower Granite Dam since June 1, 2005. Using the above table proposed by the Salmon Managers, “few” fish would be defined as less than 50 fish over a three day moving average using the total steelhead number and less than 20 fish using the wild steelhead number. The three-day average total steelhead count at Lower Granite over 11/3, 12/1, and 12/2 was 82 fish and the wild fish three-day average was 25 fish. In either case, the three-day average of fish exceeds the definition of “few” and the salmon managers would not recommend operating to zero nighttime or weekend flow. The salmon managers recommend using the proposed criterion for implementing zero nighttime and weekend flow this year.

TECHNICAL MANAGEMENT TEAM

COE:	Doug Baus / Karl Kanbergs	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
BOR:	John Roache / Mary Mellema		
NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)	Salish-Kootenai:	Stu Levit

TMT CONFERENCE CALL

Wednesday, December 4, 2013 9:00 am - 12:00 pm

Audio Conference

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6071

Web Meeting

Web Meeting Address <https://www.webmeeting.att.com>

Meeting Number (877)336-1274

Access Code 3871669

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Please e-mail her at rgumpert@cnnv.net or call her at (503) 248-4703.

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Chum Update - Charles Morrill - WDFW, and Doug Baus - COE-NWD
3. Zero Nighttime Generation on the Lower Snake River Projects - Tony Norris - BPA, and Paul Wagner - NOAA Fisheries
 - a. [Criterion](#)
 - b. [Adult Counts](#)
4. Other

- a. Set agenda and date for next meeting - **December 11, 2013**
- b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

December 4, 2013

DRAFT Facilitator's Summary

Facilitator and Notes: Robin Gumpert, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Chum Update

Doug Baus, Corps, reported that on 11/26, the chum report showed 42 lives, 5 dead and 6 redds, with 6 feet of visibility. As for operations, the chum operation began on 11/7 with a target elevation 11.5 feet and 11.3-11.7 foot range; as of 11/29 the operation had adjusted to target 11.8 feet and 11.6-12 foot range. Doug noted a brief excursion on 12/3 at 0600 hours – due to weekend precipitation, the project went to 12.2 feet for less than an hour. Doug also reported that today, the project was at 11.9 feet.

An update on the Chum operation will be provided at the December 18th TMT Business meeting (likely a conference call).

Zero Nighttime Generation on the Lower Snake Projects

The criteria for going to zero night time flow was linked to today's agenda. Tony Norris, BPA, noted that the criteria of a 3-day average of less than 50 combined and 20 wild steelhead had not quite been met, but likely would be very soon. He also noted that temperatures at Lower Granite were dropping and were similar to last year at this time. He suggested, and TMT members present on the call agreed, to coordinate the start of zero night time generation off line with NOAA and to notify TMT when the change had been made.

Action: Paul Wagner, NOAA, will email Doug when the criteria have been met, which will initiate the zero night time generation change on the Lower Snake projects. TMT will hear an update on this at the 12/18 TMT meeting.

Other

Tony Norris also reported that the new draft Emergency Action Plan is up on the TMT web page along with the draft annual WMP. The transmission and business line plans have been combined but there are no substantive changes proposed in the document. He invited salmon managers to comment and said the final would be completed along with the final annual WMP at the end of this year. That said, the Emergency Action Plan is always open for review and revision.

TMT Schedule/Year End Review

The annual TMT Year End Review will take place on Thursday, December 12th, from 9:00-3:30 at the Ambridge Center in Portland. Instructions for RSVP are included on the agenda posted to the TMT calendar – participants need to RSVP by this Friday, 12/6 to ensure enough handouts and food are provided.

The next TMT business meeting will be a conference call on December 18th at 9:00 am. Agenda topics will include: Spill Priority List; Chum Update; Zero Night Time Flow Update

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

December 4, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BOR, NOAA, BPA and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Chum Update

As of November 26, 42 live chum have been observed spawning in the Ives Island area, with 5 dead and 6 redds noted at 6 feet of visibility, Baus reported. On November 7 the Action Agencies initiated the chum operation as a range of 11.3-11.7 feet elevation in the Bonneville tailwater, targeting 11.5 feet elevation. On November 29, the Action Agencies increased the operating range to 11.6-12 feet elevation, targeting 11.8 feet. The higher operating range has remained in effect since.

At 0600 hours on December 3, Baus reported, the Bonneville tailwater elevation exceeded the 12-foot operating range and reached 12.2 feet due to heavy precipitation and other operational challenges. The Action Agencies corrected the error and the operating range of 11.6-12 feet elevation was quickly restored, targeting 11.8 feet elevation. At 0800 hours today, the Bonneville tailwater elevation was 11.9 feet.

3. Zero Nighttime Generation on the Lower Snake River Projects

The criteria this year for beginning zero nighttime generation operations on the lower Snake River are: (1) less than 50 wild and hatchery steelhead combined passing Lower Granite Dam per day for 3 days in a row, or (2) less than 20 wild steelhead passing Lower Granite Dam per day for 3 days in a row. Tony Norris, BPA, reported that forebay temperatures at Lower Granite are already the same now as they were at the end of December last year, and they're dropping fast.

Norris and Paul Wagner, NOAA, agreed to coordinate the start of zero nighttime generation on the lower Snake River and report to TMT when the criteria have been met. Wagner will notify TMT members via email.

Norris noted that the Action Agencies have posted a new draft of the emergency action plan as part of the annual Water Management Plan. He invited TMT members to comment on the emergency action plan, which was last updated in May of 2009. Absent any comments, the emergency action plan will be finalized as part of the annual Water Management Plan.

4. Next TMT Meeting

TMT agreed to meet next at the TMT year end review December 12 at the Ambridge Center in Portland. The next regular TMT meeting will be a conference call December 18 to discuss the spill priority list, the chum operation, and zero nighttime generation on lower Snake projects.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
John Roache	BOR
Paul Wagner	NOAA
Tony Norris	BPA
Bill Proctor	COE
Agnes Lut	BPA
Laura Hamilton	COE
Heather Dohan	Puget
Barry Espenson	CBB
Don Tinker	SCL
Sherry XX	Puget
Bruce McKay	Consultant
Steve Hall	COE Walla Walla
Dennis Luce	Sunscape
Glen Trager	Iberdrola

TECHNICAL MANAGEMENT TEAM

COE:	Doug Baus / Karl Kanbergs	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
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OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
WA:	Charles Morrill	MT:	Jim Litchfield / Brian Marotz
Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)	Salish-Kootenai:	Stu Levit

TMT CONFERENCE CALL

Thursday, December 5, 2013 1:30 pm - 2:30 pm

Audio Conference

Phone Number (877) 336-1274

Access Code 3871669

Security Code 9872

Web Meeting

Web Meeting Address <https://www.webmeeting.att.com>

Meeting Number (877)336-1274

Access Code 3871669

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Please e-mail her at rgumpert@cnnv.net or call her at (503) 248-4703.

Note: Members of the public are encouraged to refer to the Official Meeting Minutes and the TMT agenda links for information regarding TMT discussions and decisions. Operational decisions that are made outside of the TMT meetings will be reported at the next scheduled meeting and/or linked to the meeting agenda of the date it was discussed, as soon as is reasonably possible.

AGENDA

1. Welcome and Introductions
2. Chum Update - Scott Bettin and Tony Norris - BPA
3. Other
 - a. Set agenda and date for next meeting - **December 11, 2013**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

December 5, 2013

DRAFT Facilitator's Summary

Facilitator and Notes: Robin Gumpert, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Chum Update

Tony Norris, BPA, reported that due to the cold weather, tailwaters have been high at Bonneville in order to move more water through the system to meet power demand. BPA wanted to increase the day elevation to alleviate higher night time tailwater elevations, while minimizing risk to the chum spawning at higher elevations. Also, debris issues were causing PH2 screens to be clogged. As such, he proposed a temporary, one week, operation to increase in the day time tailwater elevation to a range of 12.7-13.1 feet, targeting 12.9 feet. The operation would be implemented today and planned to continue through 12/13, but TMT would review next week's chum surveys and have the opportunity to reassess at a conference call next Wednesday, 12/11. The intention is to return to the 11.6-12 feet tailwater elevation range in a week.

TMT questions were raised:

- What happens if we observe redds at the higher elevations? Response: We'll need to reassess at that time and look at the latest forecasts. At this point, the intention is not to maintain this higher elevation range beyond a week.
- What about impacts to night time tailwaters? Response: This operation is intended to minimize higher elevations at night, decreasing the likelihood of exceeding 16.5 feet or 18.5 feet elevations.

Action/Planned Operation: With no objections voiced on today's call, the action agencies planned to begin the temporary operation immediately: day time elevation range of 12.7-13.1 feet, targeting 12.9 feet; through 1500 hours on 12/13. **TMT will convene for a conference call on 12/11 at 9:00 am to review chum surveys and reevaluate the operation at that time.**

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

December 5, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, Colville Tribe, Oregon, USFWS, BOR, NOAA, Washington, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Action Agency Proposal for a Temporary Chum Operation

The purpose of today's unscheduled TMT meeting was to review an Action Agency proposal for a temporary change to the daytime chum operation at Bonneville Dam to facilitate additional power generation.

In response to cold weather, Bonneville has been moving as much water as possible within the current chum operating instructions to generate power during the daytime when people need it. This has resulted in high nighttime tailwater elevations as high as 18.5 feet, Tony Norris, BPA, explained. The operational change will alleviate some of the affects of current operation: the high nighttime tailwater elevations are known to be less than ideal conditions for spawning chum; debris accumulation at the Bonneville 2nd powerhouse has limited the capacity of the 2nd powerhouse limiting the ability to manage the discharge in the river without spill; and the high nighttime tailwater elevations have also affected the repair work on the Bradford Island fishladder. The Action Agencies have proposed adjusting the daytime tailwater operating range upward (to 12.7 to 13.1 feet targeting 12.9 feet) to facilitate more power generation during the day with the benefit of alleviating the likelihood of high nighttime tailwater elevations and the associated impacts. It is the intention of the Action Agencies that the operating range will return to the current operation range (11.6 to 12.0 feet targeting 11.8 feet) as the proposed higher range will inundate a band of habitat that chum typically do not choose for spawning thus minimizing the likelihood of setting a higher protection level moving forward. It is expected that TMT would discuss the return to the current operating range after field observations have been made. Charles Morrill, Washington, said WDFW will be on the lookout for signs of spawning at higher elevations and report its findings to TMT.

The details of the Action Agencies' proposal is for a temporary change to the daytime operating range in the Bonneville tailwater elevation of 12.7-13.1 feet, targeting elevation 12.9 feet, to be implemented effective immediately today through 3 pm on Friday, December 13. Once this tempory operation was complete the Action Agencies would revert back to the previous tailwater range of 11.6 to 12.0 feet targeting 11.8 feet.

There were no objections to the Action Agency proposal and it will be implemented as proposed, Baus said.

4. Next TMT Meeting

TMT will review the chum operation in a December 11 conference call after the Salmon Managers have reviewed the latest WDFW spawning survey data on December 10. The TMT year end review will be December 12. There will be a TMT conference call December 18 to address the spill priority list, the chum operation, and zero nighttime generation on lower Snake River projects.

<i>Name</i>	<i>Affiliation</i>
Tony Norris	BPA
Doug Baus	COE
Sheri Sears	Colville Tribe
Erick Van Dyke	Oregon
Dave Wills	USFWS
Dennis Schwartz	Bonneville Dam
John Victorino	SCL
Scott Bettin	BPA
John Roache	BOR
Don Tinker	SCL
Bill Proctor	COE
Paul Wagner	NOAA
Richelle Beck	Grant PUD
Karl Kanbergs	COE
Charles Morrill	Washington
Russ Kiefer	Idaho

TECHNICAL MANAGEMENT TEAM

COE:	Doug Baus / Karl Kanbergs	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
BOR:	John Roache / Mary Mellema		
NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
OR:	Erick Van Dyke	ID:	Russ Kiefer / Pete Hassemer
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Kootenai:	Sue Ireland / Billy Barquin	Spokane:	Andy Miller
Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)	Salish-Kootenai:	Stu Levit

TMT CONFERENCE CALL

Wednesday, December 11, 2013 9:00 am - 12:00 pm

Audio Conference

Phone Number (877) 336-1274

Access Code 3871669

Security Code 5134

Web Meeting

Web Meeting Address <https://www.webmeeting.att.com>

Meeting Number (877)336-1274

Access Code 3871669

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AGENDA

1. Welcome and Introductions
2. Chum Update - Charles Morrill - WDFW, and Doug Baus - COE-NWD
3. Other
 - a. Set agenda and date for next meeting - **December 18, 2013**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

December 11, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired and facilitated by Doug Baus, COE. Representatives of the COE, BOR, NOAA, BPA, Montana, USFWS, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Chum Update

Paul Wagner, NOAA, reported on behalf of Charles Morrill, Washington, who could not attend today's meeting. On December 10, WDFW surveyors observed that spawning was still occurring but nearing its end. They found no indications of redds established at higher elevations. Returning to the 11.6 ft. to 12.0 ft. range targeting 11.8 ft. in the Bonneville tailwater should therefore be protective of spawning this year.

Given that information, BPA would like to revert to the previous chum operation effective tomorrow morning, December 12, Tony Norris said. The project will revert from its current daytime operation of 12.7 to 13.1 ft. targeting 12.9 ft. in the Bonneville tailwater, as coordinated in a TMT call December 5, to the previous operation of 11.6-12.0 ft. elevation, targeting 11.8 ft. during daytime, Baus said. At night, there is still the option of allowing the Bonneville tailwater elevation to rise to 18.5 ft. However, such an elevation is unlikely given current projections, Norris said. Wagner noted that 18 feet elevation apparently cleared the area of chum. NOAA and BPA will confer further regarding the chum operation. TMT will revisit chum in its next regular meeting December 18.

3. Zero Nighttime Generation on Lower Snake River Projects

The zero nighttime generation operation went into effect when the criteria of less than 50 steelhead or less than 20 wild steelhead passing Lower Granite were met, Wagner reported [Note - email coordination sent to the TMT on December 6 cited the criteria was 3 day rolling average of less than 35 steelhead total and 10 wild]. TMT was notified by email. However, passage has since bounced back to levels that exceed the criteria. While the Salmon Managers are not requesting a cessation of zero nighttime flows at this time, if the trend were to continue, there could be conversation about eliminating or changing the zero nighttime flow operation.

Lower Granite forebay temperatures dropped dramatically, Norris noted, with some of the lowest temperatures on record. According to the most recent

counts on December 9, passage is back under the criteria again. TMT will revisit zero nighttime flows on the Snake at its next meeting December 18.

4. Next TMT Meeting

The next regular TMT meeting will be a conference call December 18 to discuss the spill priority list, the chum operation, and zero nighttime generation on lower Snake projects.

<i>Name</i>	<i>Affiliation</i>
Lisa Wright	COE
Doug Baus	COE
Paul Wagner	NOAA
John Roache	BOR
Tony Norris	BPA
Heather Dohan	Puget
Agnes Lut	BPA
Barry Espenson	CBB
Don Tinker	SCL
Sheri Kress	Puget
Jim Litchfield	Montana
David Wills	USFWS
Mike Shafley	Snohomish PUD
Tom Lorz	CRITFC

TECHNICAL MANAGEMENT TEAM

COE:	Doug Baus / Karl Kanbergs	BPA:	Tony Norris / Scott Bettin / Robyn MacKay
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NOAA:	Paul Wagner / Richard Domingue	USFWS:	David Wills / Steve Haeseker
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Colville:	Sheri Sears / Keith Wolf	Nez Perce:	Dave Statler
Umatilla:	Tom Lorz (CRITFC)	Salish-Kootenai:	Stu Levit

TMT CONFERENCE CALL

Wednesday, December 18, 2013 9:00 am - 12:00 pm

Audio Conference

Phone Number (877) 336-1274

Access Code 3871669

Security Code 3417

Web Meeting

Web Meeting Address <https://www.webmeeting.att.com>

Meeting Number (877)336-1274

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AGENDA

1. Welcome and Introductions
2. Chum Update - Charles Morrill - WDFW, and Doug Baus - COE-NWD
3. Zero Nighttime Generation on the Lower Snake River Projects - Tony Norris - BPA, and Paul Wagner - NOAA Fisheries
 - a. [Criterion](#)
 - b. [Adult Counts](#)
4. Spill Priority List - Doug Baus - COE - NWD

- a. [List](#)
- 5. NWRFC Official Forecast Procedure Change - *Tony Norris, BPA*
- 6. Other
 - a. Set agenda and date for next meeting - **January 8, 2014**
 - b. [\[Calendar 2013\]](#)

For questions about the meeting, contact the TMT Chair:

[Doug Baus](#) - (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

December 18, 2013

Facilitator's Summary

Facilitator: Emily Gumpert, DS Consulting; Facilitation Support: Donna Silverberg, DS Consulting

The following facilitator's summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Chum Update

Charles Morrill (WDFW) reported that chum spawning activities have passed the peak; surveys this week showed very few chum present in the Ives area and ~ 200 in the I-205 area. One fresh female chum was collected in the Duncan Creek trap. The Duncan Creek trap will be removed on December 24, 2014 and the tail water levels will shift downwards once removed. COE, BPA and WDFW are coordinating this removal to ensure a safe removal of the trap. WDFW and BPA noted that they believe the trap can be safely removed with the current levels, but the level may need to be lowered for a brief period; the COE noted that they could provide a lower tailwater for several hours to facilitate removal of the trap if needed.

Action: The Action Agencies will continue the current Chum tailwater operation of 11.6 to 12.0ft, targeting 11.8ft through Dec 24th at 6pm and then plan on ending the spawning operation and implementing the incubation /emergence operation, which will operate to maintain a minimum tailwater elevation of 11.5 ft. WDFW plans to remove the Duncan Creek trap prior to the end of the current operation.

Night Time Generation

Tony Norris, BPA noted that they are working with NOAA to stay on track with regards to nighttime generation. The SOR has been posted on the TMT website that outlines the criteria for night time generation and the latest fish counts (less than 10 per day). Zero night-time generation will be used on an as needed basis. NOAA reported that they are fine with this operation.

Spill Priority List

Doug Baus, COE clarified that the current Spill Priority List ends on 12/31/13. The new priority list has been posted and will be in effect from 1/1/14 through 3/31/14, followed by and April 1 list for migration season. The list is: BON, TDA, JDA, MCN, ICH, LMN, LGS, DWK, CHJ, and GCL. Paul Wagner, NOAA, noted that FPAC concurs with this list and support it's beginning on January 1st.

Action: The new spill priority list will go into effect on January 1st, 2014.

Forecast Procedure Change

Tony Norris, BPA reminded the group that the NW River Forecast Center (NWRFC) has been producing 3 ESP forecast each week (or more often) for various forecast points, differentiated by the number of days of deterministic weather forecasts used to initialize the forecast. runs per week which have helped managers make decisions at TMT. In 2013, the Action Agencies used the 50% exceedance value for the 3 day initialization as the "Final" forecast. Recently, the NWRFC contacted the region about modifying the ESP forecasts it produces to change the 3 day weather forecast with a 5-day weather forecast. This change is in recognition of the growing confidence the meteorological community has gained in the ability of the weather models to provide useful forecasts out to 5 days. The NWRFC made this modification last week and the Action Agencies will now use the new ESP forecast with 5-days of a short-term forecast included instead of the 3-day forecast

Action: The new 5-day forecast will be used for the official forecast starting in January.

Other

The salmon managers noticed that Libby is above flood control for December and wondered whether they might hope to see more water at the end of the year? Tony Norris noted that the COE will not end December above the end of December flood control elevation.

The next TMT meeting will be a face-to face meeting on January 15th from 9:00-12:00.

Agenda topics will include: Water Supply Forecast; Chum Update; Operation Review; and Year End Review debrief. TMT members were asked to keep January 8th (and all Wednesdays) as a placeholder for a TMT call, if needed.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM – OFFICIAL MINUTES

December 18, 2013

Minutes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Emily Plummer, DS Consulting. Representatives of the COE, NOAA, BPA, BOR, Washington, Oregon, Idaho, Colville Tribe, USFWS, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript.

2. Chum Update

Spawning activity is well past its peak, with maybe a few hundred redds at the I-205 site, Charles Morrill, Washington, said. There currently only a handful of fish in the Ives Island area. The current chum operation calls for an elevation band of 11.6-12 feet, targeting 11.8 feet in the Bonneville tailwater. The plan moving forward is to maintain this daytime tailwater requirement until December 24 at 1800 hours. At that time the new requirement will be to maintain an 11.5 minimum tailwater on all hours, Baus said. There is also a need to remove the fish trap on Duncan creek. WDFW is planning on removing it December 24. The Action Agencies and the state of Washington are coordinating this effort. If the trap cannot be removed on that date or at the tailwater occurring on the 24th it will occur at a later date. If necessary the tailwater may temporarily drop below the hard constraint of 11.5 feet for trap removal.

3. Zero Nighttime Generation on Lower Snake River Projects

The latest adult counts at Lower Granite are less than 10 steelhead per day, Tony Norris, BPA, reported. This is well below the criterion for zero nighttime generation at lower Snake projects. The Action Agencies have been implementing zero nighttime generation as needed, Baus said. The criterion and current counts are posted to this item on today's agenda.

4. Spill Priority List

The current spill priority list will expire as of December 31, Baus said. The Action Agencies' proposed spill priority is attached to this item on today's agenda. It will go into effect from January 1 to March 31, 2014, with spill priority in the following order: Bonneville, The Dalles, John Day, McNary, Ice Harbor, Lower Monumental, Little Goose, Lower Granite, Dworshak and Grand Coulee dams.

5. NWRFC Official Forecast Procedure Change

The Northwest River Forecast Center has changed its procedures for the official ESP inflow forecast each week, Norris said. In 2013, BPA used the 3-day forecast as its official forecast. As of last week, the RFC modified its process to 5 days instead of 3 for

its official forecast. So the Action Agencies are now using the NWRFC 5-day forecast. The official forecast will be forecast issued on the 5th working day of the month.

6. Next TMT Meeting

TMT will meet next in person on January 15, with a forecast update and a chum update on the agenda. There is a placeholder for a TMT conference call on January 8 if needed.

<i>Name</i>	<i>Affiliation</i>
Paul Wagner	NOAA
Tony Norris	BPA
John Roache	BOR
Doug Baus	COE
Charles Morrill	Washington
Scott Bettin	BPA
Erick Van Dyke	Oregon
Barry Espenson	CBB
Mike Shafley	Snohomish PUD
Heather Dohan	Puget
Don Tinker	SCL
Greg Lawson	Thompson Reuters
Lisa Wright	COE
Sheri Sears	Colville
Russ Kiefer	Idaho
David Wills	USFWS
Tom Lorz	CRITFC

SPILL PRIORITY LIST - Effective January 1, 2014 through March 31, 2014.

LEVEL 1 – up to the 110% TDG STANDARD¹		
PRIORITY ORDER	PROJECT	SPILL ESTIMATE (KCFS)
01	BON	70
02	TDA	45
03	JDA	20
04	MCN	48
05	IHR	25
06	LMN	18
07	LGS	18
08	LWG	20
09	DWR	35% of total flow
10	CHJ	25
11	GCL	0 (OT) or 5 (DG) ²

LEVEL 2 – up to 115% TDG		
PRIORITY ORDER	PROJECT	SPILL ESTIMATE (KCFS)
12	BON	100
13	TDA	60
14	JDA	80
15	MCN	80
16	IHR	35
17	LMN	23
18	LGS	23
19	LWG	30
20	CHJ	61
21	GCL	5 (OT) or 10 (DG) ²

LEVEL 3 – up to 120% TDG		
PRIORITY ORDER	PROJECT	SPILL ESTIMATE (KCFS)
22	BON	140
23	TDA	135
24	JDA	144
25	MCN	140
26	IHR	75
27	LMN	44
28	LGS	52
29	LWG	45
30	CHJ	150
31	GCL	10 (OT) or 15 (DG)

LEVELS 4-7 (125%, 127%, 130%, and 135% TDG, respectively): Same project Priority Order as in Level 3.

¹ Outside of Fish Passage Season, the Clean Water Act standard for total dissolved gas (TDG) is ≤110% at all projects.

² Spill at GCL is either through the outlet tubes (OT) or the drum gates (DG), depending on reservoir elevation. Spill through the OT produces more TDG.