COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
June 7, 2017
Facilitator's Summary
Facilitator: Emily Stranz; Notes: Charles Wiggins, 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. Official minutes can be found on the TMT website: http://www.nwd-wc.usace.army.mil/tmt/agendas/2017/

Meeting Minutes and Facilitator's Summary
The Official meeting Minutes and Facilitator's Summary for the May 17th TMT meeting were approved with no additional edits. Those for May 31st will be posted for review at the next TMT meeting.

Water Supply Forecast
The US Army Corps of Engineers and Bureau of Reclamation reported on the official June water supply forecasts. Mary Mellema, BOR, reported:

- Hungry Horse inflow forecast for June through July is 121% of average; January through July is 129% of average; April through August is 120% of average; and May through September is 119% of average.

Doug Baus, Corps, reported:
- The Dalles April-August is 132% of average
- Lower Granite April-July is 148% of average
- Libby April-August is 129% of average
- Dworshak April-July is 116% of average
- Grand Coulee April-August is 124% of average
- Albeni Falls April-Aug is 127% of average.

Little Goose Special Spill Operation for Adult Passage
Paul Wagner, NOAA, reported on the special spill operation coordinated at the TMT meeting on June 5 and summarized on the TMT web site, noting that the 30% spill was more effective than the 40% spill operation in getting fish to pass. The operation took place on Tuesday and Wednesday, June 6-7. Its main feature was to reduce spill to 30% from 4AM to 10AM, pass inflows through the afternoon, then at 4PM proceed to return to MOP by 4AM the next morning. The operation was designed to lessen the energy and velocity of an eddy caused by high levels of spill, which formed between the peninsula and the navigation lock. It is hypothesized that the eddy is confusing Chinook and limiting passage into the ladder entrance. The operation as scheduled will end at 4AM Thursday, June 8.

Anne Setter, Corps, reported that a trash screen cleaning operation at Little Goose was conducted on June 5th and 6th and is complete. Because of a debris mat in the forebay, the trash rack cleaning was only partially effective. Due to concerns of debris impact to juvenile fish, an emergency debris spill was conducted on June 6th and was also somewhat effective, removing between ½ and 2/3 of the debris. As the debris travels downstream, a debris spill at Lower Monumental may be needed.

During the operation, TDG levels ranged between 120 and 128%. The sole exception was for the one-hour debris spill operation at 4PM on June 6. Spill went to 81%, and TDG levels crested at 143.6%, returning to below 130 by the third hour. Because water was held in the forebay during reduced spill, the pool elevation went above MOP (at 634), to MOP+1. There was no evidence of gas bubble trauma in either adults or juveniles as a result of the operation.

On June 6, the first day of the operation, 1,542 adult spring Chinook passed Little Goose. This compares to 578 (6/4) and 390 (6/5) the previous two days. The hourly report shows that most passed from 8AM to 10AM.

Russ Kiefer, Idaho, reported on FPAC conversations. He noted that although there is only a day of data, said it appears the 30% spill operation is helping adult passage. He recommended continuing the operation for a week unless data show concern for high TDG levels. Members discussed whether to change the start time from 4AM to a later time; whether to extend the duration of reduced spill; whether to close or decrease flow over the TSW, and whether to reduce spilling to the 125% spill cap and keep water at a higher MOP to allow for lower TDG.

Erick Van Dyke, Oregon, shared his perspective that the river is currently "unmanaged", because river flow conditions are so far outside of the normal range and have been for some time. Doug Baus, Corps, asked why the term unmanaged continues to be used when describing current conditions in the Snake River. The current TMT coordinated operation to reduce spill down to 30% at Little Goose Dam to facilitate adult Chinook passage is being implemented because the BPA and the Corps are able to manage flows in the Snake River. Flows are above average at this time but there are numerous management actions (e.g., operation outside of 1%, removal of screens, and the current operation above MOP) that have been previously coordinated with the TMT and discussed in the BiOp to manage flows to address fish passage issues. It was noted that subgroup has been stood up to discuss various management tools at Little Goose.

TMT reached consensus -- the majority of members present voiced support (BOR, BPA, Colville, Corps, ID, MT, Nez Perce, NOAA, Umatilla, USFWS, Warm Springs, and WA), and Oregon did not oppose the following operation: Beginning June 8 at 4AM and continuing until June 15 at 4AM:

- Maintain 30% spill from 4AM to 12PM;
- Pass inflow from 12PM until 4PM;
- Increase spill evenly from 4PM until 4AM to return to MOP, unless TDG levels exceed 130%;
- If a TMT member raises concern that may require a change in this operation, TMT will hold an unscheduled meeting. Salmon Managers should contact Paul Wagner or Tom Lorz to request such a meeting; Action Agencies should contact Doug Baus.
- A check in meeting is tentatively scheduled for 11:00AM on Monday, June 12th; this meeting will be cancelled if there are no concerns at the time.

Dworshak Dam Short Duration Activity Exemption

Dan Turner, Corps, provided an update on Dworshak summer operations coordination. The Corps is coordinating with the Nez Perce and Idaho on a short-term exemption to TDG standards. Unit 3 will remain out of service through summer temperature augmentation operations, thus TDG is likely to exceed standards at times between July 1 through October 1. They are expecting to request a 120% target.

Operations Review

Reservoirs: Mary Mellema, BOR, reported on Bureau of Reclamation projects:

- Hungry Horse midnight elevation was 3,545.8ft, current discharge is 8.4 kcfs, inflows are 16.8 kcfs.
- Grand Coulee midnight elevation was 1,272ft.

Lisa Wright, Corps, reported on US Army Corps of Engineer projects:

- Libby midnight elevation was 2,413.5 ft, current inflows are 53.2 kcfs, discharge is 25 kcfs. Libby is in the process of implementing the second sturgeon pulse and water temperatures are responding favorably.
- Albeni Falls midnight elevation was 2,060.5ft, inflows are 91.4kcfs and outflows are 90.5 kcfs.
- Dworshak midnight elevation was 1,589.5ft, inflows are 16.9kcfs and discharge is 2.2kcfs. Discharges are expected to increase within the next few days.

- Lower Granite average outflows were 163.7kcfs.
- McNary average outflows were 433.0kcfs.
- Bonneville average outflows were 434.6kcfs

Fish

Paul Wagner, NOAA, reported on fish. As far as passage at Bonneville goes, spring Chinook adults are at 56% of average; jack springers are at 70% of average; summer Chinook are at 83% of average; and summer jacks are at 63% of average. Lamprey are doing extremely well, at 425% of average. And Sockeye passage at Bonneville is 38% of average, but it is early in the run. McNary spring Chinook are at 46% of average and jacks are at 42% of average. Lower Granite spring Chinook are at 27% of average and jacks are at 43% of average. He noted that there is delay between Bonneville and McNary.

Paul also reported on juveniles. He noted that overall the run started earlier, and ended earlier, for Chinook and steelhead. Sub-yearlings are underway now. Most species saw two passage peaks, the second of which is muted upriver.

Water Quality

Dan Turner, Corps, reported that TDG is up in the system because of increased flow, generally in the high 120s in project tailraces. The Cascade Island station is malfunctioning, and repairs are two weeks away. The Warrendale gauge will be used in the interim.

Power Supply

Tony Norris, BPA, reported there was nothing to report.

If necessary, a TMT conference call will be held on Monday, June 12, at 11:00. The next regular TMT meeting will be a conference call on June 14, at 9:00.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 7, 2017
Minutes: Pat Vivian

1. Introduction

Representatives of NOAA, the COE, BPA, USFWS, Oregon, Montana, Washington, Idaho, and the Colville, Nez Perce, Umatilla and Warm Springs tribes participated in today's TMT meeting. Doug Baus, COE, chaired the meeting with facilitation by Emily Plummer, DS Consulting.

2. Review Meeting Minutes – May 17

The meeting minutes and facilitator's summary for May 17 were approved as final today.

3. Water Supply Forecast

Mary Mellema and Doug Baus gave the June 1 inflow forecasts for individual basins.

- Hungry Horse (June-July) – 1040 kaf, 121% of average
  (January-July) – 2,698 kaf, 129% of average
  (April-August) – 2,326, 120% of average
  (May-September) – 2,020, 119% of average
- The Dalles (April-August) – 116 maf, 132% of average
- Lower Granite (April-July) – 29 maf, 148% of average
- Libby (April-August) – 7,594 kaf, 129% of average
- Dworshak (April-July) – 2,838 kaf, 116% of average
- Grand Coulee (April-August) – 70 maf, 124% of average
- Albeni Falls (April-August) – 16 maf, 127% of average

4. Little Goose Spill Operation for Adult Passage

4a. Summary of Little Goose Special Operation. At the Friday, June 5, unscheduled meeting, TMT coordinated a special spill operation to aid adult passage on June 6 and 7. Baus walked TMT through the three components of the operation, which is also posted to today's agenda:

1. From 4 am to 10 am, implement a 30% spill treatment while running the generators as consistently as possible. Fill above minimum operating pool (MOP) as needed to store water while limiting spill to 30% of inflows. This will require forebay elevation increases.

2. From 10 am to 4 pm, pass inflows. Screen cleaning is completed, so there will be no 2 unit rolling outages during this time period.

3. From 4 pm to 4 am, draft out any water that was stored during step 1 and return the project to its MOP range of 633-634 ft. Spill will not exceed 140 kcfs as a hard constraint to avoid exceeding 130% TDG in the LGS tailrace. If inflows are higher than forecasted, or if there are unforeseen unit outages, the LGS pool may not be drafted back to the MOP range during this time.

This operation was effective June 5-6 as coordinated at TMT and will continue until 4 am tomorrow, June 8, when the last of the stored water is released and the project has drafted back to MOP range. TMT's main task today was to review the operation and decide whether to continue it.

Debris accumulation in the forebay led to an emergency debris spill this morning, Ann Setter, COE Walla Walla, reported. She confirmed that all five units are back in service now that trash raking is complete. Dave Swank, USFWS, asked whether the trash rake is effective at removing all debris. Setter said debris tends to form a mat in the forebay, for which the trash rake is ineffective, so project staff resorted to surface dips and cleared a lot of debris that way. However, emergency spill was necessary because the smaller debris that doesn't rise to the surface can be a significant factor in descaling. The COE will give an update on debris management at the next TMT meeting.

There was discussion of the eddy downstream of Little Goose that makes ladder entry difficult at rates of spill above 30%. Based on adult counts, at 30% spill, apparently the fish were able to move through the eddy and find the ladder entrance, Paul Wagner, NOAA, said.

4b. Adult Passage. On June 6, the first day of the special operation, 1,542 spring chinook adults passed Little Goose Dam. This was generally hailed as a significant improvement over previous counts of 390 (June 5).

Today's counts with 30% spill were 7 fish from 5-6 am, 89 fish from 6-7 am, 92 fish from 7-8 am, and 219 fish from 8-9 am. Because trash raking is completed, today's operation will probably benefit from not having units 1 and 2 go out of service.

Jay Hesse, Nez Perce, said these data indicate that 30% spill is more effective for adult passage than 40% spill. Erick Van Dyke said it's hard to prove that 30% spill is responsible for the increase in adult passage. Dave Swank, USFWS, agreed it's hard to know for sure based on 1.5 days of data, but Scott Bettin said these results are consistent with prior findings that 30% spill at Little Goose is what works best for adults.

Van Dyke characterized the situation as unmanaged in terms of high inflows throughout the system, i.e. more than 100% of normal. Baus inquired why the current situation continues to be described as unmanaged when reducing spill down from 50% to 30% of total outflows demonstrates that flows are being managed and conversion rate of adults Chinook from Lower Monumental Dam to Little Goose Dam has improved. Baus noted that (1) adjustments to the Little Goose Dam forebay elevation (Minimum Operating Pool) and (2) operation of the units above 1% efficiency are both identified in the BiOp as management tools that can be used to aid adult passage. Running the units outside of 1% efficiency would equate to about an additional 2 kcfs per unit or an additional 10 kcfs in project generation outflows (with an equivalent reduction in spill of 10 kcfs) with all 5 units on line that could be used as a management tool to improve tailrace hydraulics and improve passage for adult Chinook past Little Goose Dam. Another management options that has been used to manage high flows and debris is the removal of screens.

Tom Lorz said this is not RPA-related during the specific time when flows are adjustable. The situation has been "tweaked" to provide a few hours of relief, which is not the same as normal operation. He agreed that 30% spill works for adult passage at Little Goose.

Jim Litchfield, Montana, said a day and a half of data are not a lot, but the results are indicative of success. It might make sense to use 2 ft of pondage to start the operation early, Scott Bettin suggested. Discussion turned to what's next for the Little Goose operation, currently scheduled to end at 4 am tomorrow morning.

Yesterday FPAC talked, Russ Kiefer reported, and the collective recommendation is to continue 30% spill through next week unless there are indications to the contrary. Trevor Conder, NOAA, said it probably takes fish an hour or so to sense the change in spill, move up the ladder and be counted. This would account for lower numbers during the first hour of 30% spill, so the start time doesn't need to be changed.

TMT considered increasing the number of hours per day at 30% spill, as well as shifting the TSW from the low crest to the high crest position or removing the TSW entirely. Generally it takes 3 days to change the TSW operation, Setter said. The earliest it could be changed is June 12. Scott Bettin said the TSW is good at passing debris, and removal involves a tradeoff. Pulling the TSW risks affecting passage conditions by shifting spill away from unit 1 and creating an eddy on the far side of the tailrace.

Trevor Conder suggested TMT consider operating units 1 and 2 above 1% efficiency because that would pass more flows and help counteract the eddy. Bettin proposed extending 30% spill for 2 hours (4 am-noon) with a TDG cap of 125% instead of 130%. TMT considered the options moving forward:

1. Continue the 30% spill operation the same as it has been the past 2 days
2. Extend 30% spill by 1-2 hours
3. Change the gas cap to 125% during release of storage

Russ Kiefer recommended extending 30% spill for a few hours and keeping the start time of 4 am. He didn't support lowering the TDG limit and advocated spreading out the TDG levels as evenly as possible over the 12 hours of returning to MOP. Julie Ammann, COE, asked him if pool velocity was driving his concern about returning to MOP, and he said yes, he didn't want the reservoir getting too full to support 8 hours of 30% spill as planned. Generally, faster flows are better for juvenile passage, so this involves a tradeoff.

Bettin suggested a 125% gas cap for a few days to give fish a break downstream of the dam. Kiefer said the only place where symptoms of gas bubble trauma were seen was the mid-Columbia. Apparently GBT was not seen to the extent that it would offset the benefits of more spill in terms of travel times. As for the effects of high TDG on adults, those that made it to Lower Granite were not showing signs of GBT. Lorz said putting more flows over the TSW would exacerbate the eddy downstream, so that's one more reason not to store water above MOP. Baus added the current inflow forecast indicates that by the end of the 10 day forecast (6/16), Little Goose Dam will resume 30% spill on a daily basis when project inflows drop below approximately 130 kcfs.

Kiefer proposed running the 30% spill operation from 4 am to noon daily instead of stopping at 10 am. From 4 pm to 4 am, spill would rise to get the project back to MOP by the next morning in preparation for the next 8 hours of 30% spill. This was the operation TMT members were polled on (see below) to be continued through the next TMT meeting on June 14 unless the Salmon Managers reach consensus that it should be stopped. TMT views were as follows:

- **NOAA** – Supports the operation.
- **USFWS** – Supports the operation.
- **Oregon** – Doesn't oppose the operation, but is increasingly uncomfortable with the changes.
- **Idaho** – Supports the operation.
- **Washington** – Supports the operation.
- **Montana** – Supports the operation.
- **Colville** – Supports the operation. Has concern about storms coming in, with perhaps more debris accumulation.
- **Nez Perce** – Supports the operation.
- **Umatilla** – Supports the operation.
- **Warm Springs** – Supports the operation.
- **BOR** – Supports the operation.
- **BPA** – Supports the operation.
- **COE** – Supports the operation.

With consensus on the operation, Little Goose will continue spilling 30% of inflows from 4 am to noon, passing inflows from noon to 4 pm, and drafting to MOP from 4 pm to 4 am the next day. This operation will end on June 15 at 4 am unless TMT decides otherwise.

TMT scheduled a placeholder conference call for 11 am Monday, June 12, to revisit Little Goose spill if needed.

4c. Little Goose Hourly Operations Data. There are problems with data collection which the COE is working to resolve, Baus said.

4d. Little Goose % Spill. The data indicate spill of 84.8 kcfs (50% of inflow) was reduced to 38.9 kcfs for the 30% operation. As a result, at midnight the Little Goose forebay elevation peaked at 637.87 ft (June 6 at 1200 hours) from its MOP range of 633-634 ft according to the data posted. Baus said 637.87 ft seems high, and he will follow up with TMT if this is an error.

These results are confounded by a debris spill of 81% of inflows, which accounts for 2 ft of forebay elevation. At 4 pm on June 5 during debris spill of 135.1 kcfs, TDG values peaked at 143.8% downstream. Dan Turner, COE, emphasized this spike was due to the debris spill, not the 30% operation.

At spill of 109.4 kcfs, TDG values were 134%, Setter said. By 1800 hours, TDG values were down to 128% and gradually decreased from there.

Erick Van Dyke, Oregon, asked, did the debris spill remove all woody debris? Half to two-thirds, Setter replied. At 10 am on June 6, TDG values were 118% during the blocks of 30% spill, then rose to 128% when the excess water was spilled at night. Spill of 79 kcfs produced 125% TDG.

5. Dworshak Dam Short Duration Activity

After coordination with the Nez Perce Tribe and IDFG, the COE will request a short term exemption from the 110% TDG criteria downstream of Dworshak Dam due to generation restrictions caused by the unit 3 outage, Dan Turner reported. The exemption will probably target 120% TDG downstream of Dworshak from July 1 to October 1.

6. Operations Review

6a. Reservoirs. Mary Mellema, BOR, and Lisa Wright, COE, reported. Grand Coulee is at elevation 1272.2 ft. Hungry Horse is at elevation 3545.8 ft with inflows of 15.8 kcfs and discharges of 8.4 kcfs.

Libby is at elevation 2,413.5 ft with inflows of 53.2 kcfs, discharging full powerhouse flows of 25 kcfs. Albeni Falls is at elevation 2060.9 ft, with inflows of 91.4 kcfs, discharging 90.5 kcfs. Dworshak is at elevation 1589.5 ft with inflows of 16.9 kcfs discharging 2.2 kcfs.

Lower Granite outflows are 163.7 kcfs, McNary outflows are 433.0 kcfs, and Bonneville outflows are 434.6 kcfs.

6b. Fish. Paul Wagner, NOAA, reported.

Adults: Spring chinook arrivals at Bonneville are coming to an end as the run transitions to summer. For the year, a total of 83,624 spring chinook arrived, which is about 56% of the 10 year average. Jack counts were 18,110, about 70% of the 10 year average. Summer chinook counts are 9,371, which is about 83% the 10 year average. Summer chinook jacks are at 1,390, which is 63% of the 10 year average. The summer chinook return may be stronger than the spring return. Adult lamprey returns at Bonneville are 7,840 – a record-busting 425% of the 10 year average. Sockeye returns are 524, which is 38% of the 10 year average.

At McNary, spring chinook counts are 41,708, which is 46% of the 10 year average. Spring chinook jacks are 5,610, which is 42% of the 10 year average. It was noted there's a passage delay between Bonneville and McNary.

At Lower Granite, spring chinook returns are 14,395, which is 27% of the 10 year average. Jack chinook returns are 4,345, which is 40% of the 10 year average. Adult chinook were generally late in returning this year, and there were two distinct peaks in passage. The second peak has not yet materialized at sites upriver such as Ice Harbor. There's still time for hope that adult counts at upriver sites will increase.

Juveniles: This year overall the run was early and counts have since fallen off. This is true for both chinook and steelhead yearlings. Subyearling passage is underway very early this year in terms of the 10 year averages.

6c. Water Quality. Dan Turner, COE, reported that TDG percentages are in the high 120s at some tailraces due to increased inflows. The Cascade Island gage downstream of Bonneville has been giving low TDG readings which probably indicates the gage is malfunctioning. With high flows it won't be possible for USGS workers to access the gage for up to two weeks. In the meantime, the COE will use the Warrandale gage to assess water quality at Bonneville Dam.

6d. Power. There was nothing to report today.

7. Next TMT Meeting

A placeholder conference call was scheduled for 11 am Monday, June 12, if conditions at Little Goose raise concerns. The next regular TMT meeting is a conference call June 14.

Name	***Affiliation***
Paul Wagner	NOAA
Julie Ammann	COE
Tony Norris	BPA
Scott Bettin	BPA
Makary Hutson	BPA
Doug Baus	COE
Laura Hamilton	COE
Dave Swank	USFWS
Dan Turner	COE
Charles Wiggins	DSC
Erick Van Dyke	Oregon
Lisa Wright	COE
Jim Litchfield	Montana
Phone:	
Charles Morrill	Washington
Mary Mellema	BOR
Russ Kiefer	Idaho
Sheri Sears	Colville Tribe
Jay Hesse	Nez Perce
Tom Lorz	CRITFC
Ann Setter	COE Walla Walla
Michael Bryant	CBB
Margaret Filardo	FPC
Dave Benner	FPC
Mike Shafley	Snohomish PUD
Laura Berg	Clearing Up
Jen Graham	Warm Springs