

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 5, 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 June 14 and June 21 TMT meetings were approved with no additional edits. Those for June 28 will be reviewed for approval at the next TMT meeting.

System Operational Request 2017-C 1 Extension – CRITFC

Kyle Dittmer, CRITFC, reported that CRITFC and the Corps have coordinated to extend SOR 2017-C1 for another week, from July 3 through July 6. The SOR requests a 1.5ft forebay operating band for the Bonneville, The Dalles and John Day pools during the treaty fishing periods. The Corps is currently implementing this SOR. Kyle noted that there may be an additional fishing season the next week, depending on counts. CRITFC is conducting a net flight today and will be looking at catch data as well; Kyle will report results to TMT soon. Kyle noted that CRITFC is still talking internally with fishers to determine their preference of weekly dates (Monday-Thursday or Tuesday through Friday).

Dworshak Operations

Alfredo Rodriguez, Corps, presented on Dworshak operations. Because of increasing temperature in the Lower Granite tailrace, at midnight on June 30, the project increased discharge from 7 kcfs to 9 kcfs and held it at 9kcfs through the weekend. During the weekend, TDG in the Dworshak tailrace ranged between 115% and 118% and temperature readings at the Lower Granite tailrace ranged between 64-68 degrees Fahrenheit, with the highest readings at 4:00 PM. Currently, the Dworshak reservoir is at 1597.69 ft elevation, with outflow at 8.8 kcfs. Lower Granite tailrace temperature is at 66.5 degrees F.

To inform operations moving forward, the Corps today provided 3 modeling scenarios for TMT to consider:

- 1) Hold flow at 9 kcfs to maintain temperatures close to the 68 degree margin, and check in with the TMT during our next meeting on July 12;
- 2) Increase flow to 10 kcfs at midnight July 5 to provide some temperature relief, but with TDG likely increasing to 120%; and
- 3) Increase flow to 11 kcfs at midnight, temperature impact would be similar as with scenario 2, however, TDG is modelled to go above 120%.

Under these three scenarios, the model is assuming that Anatone flows will drop off, however, it is unclear what Idaho Power plans to do in the near future, and Hells Canyon could come up adding more warm water into the system. Jay Hesse, Nez Perce, agreed to reach out to Idaho Power to get a better idea of their plans.

Additionally, a fourth option was briefly discussed, which entailed holding discharge at 9kcfs for a few days and then bumping up to 10kcfs. Erick Van Dyke, OR, thought this would be a prudent option, however, there was little traction due to the water travel time from Dworshak to Lower Granite and the unknown of Anatone flows.

Kyle Dittmer, CRITFC, stated that the near term forecast for Idaho is hot for the next few days, returning to normal cooler temperatures by the end of the week.

TMT discussed how to best manage Dworshak this year given the BiOp requirements and project limitations due to the Unit 3 outage. Doug Baus, Corps, explained that the BiOp requires the Corps to regulate Dworshak outflow to attempt to maintain water temperatures at the Lower Granite Dam tailwater at or below the water quality standard of 68 degrees F and be within the state of Idaho TDG water quality standards of 110%. Doug continued that unfortunately, due to project constraints this year, it may not be possible to achieve both of these BiOp objectives at some point, even with the current TDG exemption. For example, with the current coordinated operation, the benefit to the hatcheries downstream of Dworshak Dam resulting from reduced Dworshak Dam outflow and TDG comes at a cost to adult salmon downstream of Lower Granite Dam that will experience relatively higher temperatures. Doug emphasized that due to the complexity of managing Dworshak Dam outflows and Lower Granite Dam tailrace temperatures, the TMT needs to clearly prioritize TDG downstream of Dworshak or temperatures below Lower Granite in order to ensure that operations have successful outcomes and asked TMT for input. Jay noted that temperature at the Lower Granite tailrace, TDG, gas bubble trauma in hatchery and in-river fish, and adult passage all need to be taken into consideration. From the Nez Perce perspective, the Corps should operate to maintain 68 degree water temperatures at Lower Granite, going up to 120% TDG in the Dworshak tailrace when necessary to do so, however, not to exceed the 120% waiver. He continued that the waiver states that 121% allows the Corps to operate to 120% TDG with a 1% safety buffer to account for daily variation. Dave Swank, USFWS, explained that the hatcheries are not comfortable with 120% TDG and asked that the Corps drop discharge when at all possible.

TDG data from the Dworshak hatchery is linked to the TMT agenda. It shows that at 9 kcfs, TDG readings were 102% at the hatchery collection channel. In the past, the hatchery managed up to 115% TDG in-river. The group discussed the short and long term impacts of high TDG and gas bubble trauma. It was noted that during this past spring the Dworshak Hatchery fish went “off feed” at 104-105% TDG, and both short- and long-term consequences of this situation can be anticipated throughout the life cycle, however, are not easy to track. In the past, when TDG levels have decreased, fish went back on feed but did not expel existing gas bubbles. Literature shows that GBT kills tissue in fish, however, it is not clear how this impacts survival in the long run.

- **CONSENSUS:** Based on their conversation, TMT agree to increase flow at Dworshak to 10 kcfs at midnight on July 5th, operating to keep TDG levels at or below 120%. The Corps will reduce flows if conditions allow for it.
- **ACTION:** The Corps will implement the above stated operation. Jay and Dave will connect with hatchery managers and stay apprised of conditions in the hatchery, reporting back to TMT. TMT will reconvene to review operations and projections at 11 AM Monday, July 10.

Operations Review

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

- Hungry Horse midnight elevation was 3,555.4 ft, current inflows are 3.4 kcfs, and discharge is 2.3 kcfs.
- Grand Coulee midnight elevation was 1,286.2 ft.
- Mary also provided an Upper Snake River flow augmentation report. BOR hopes to begin flow augmentation operations from Palisades Dam late this week or early next week. They are scheduled to move 487KAF out of the Upper Snake.

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

- Libby midnight elevation was 2,442.4 ft; current inflows are 26.7 kcfs, discharge is 11 kcfs.

- Albeni Falls midnight elevation was 2,062.2 ft; yesterday's average inflow was 27.5 kcfs and outflows were 31.3 kcfs.
- Dworshak midnight elevation was 1,597.9ft; inflow yesterday was 3.9 kcfs and discharge was 8.9 kcfs.
- Lower Granite average outflows were 65.8 kcfs.
- McNary average outflows were 251 kcfs.
- Bonneville average outflows were 218.6 kcfs

Fish: Paul Wagner, NOAA, reported on fish. At Bonneville, summer Chinook counts are looking better than spring Chinook this year, they are currently around 67,000. Sockeye have likely peaked at 72,000 and lamprey at Bonneville are at an impressive 43,000. The transition upriver appears to be improving for lamprey; they are now passing The Dalles as flows have receded. At McNary, summer Chinook are at 38,000; sockeye are 41,000, and lamprey are at 97. And at Lower Granite, 5,700 summer Chinook has passed and 35 sockeye. Paul noted that no one is expecting a banner year for sockeye, as the returns this year are largely the 2015 cohort. Steelhead seem to be a bit delayed this year, with few passing Bonneville.

For juveniles, overall the run was earlier for yearling Chinook and steelhead. Subyearling Chinook are underway now and are doing well, with 165,000 past McNary.

Water Quality: Dan Turner, Corps, reported that there is no longer involuntary spill and TDG is well within state water quality standards throughout the system.

Power Supply: Tony Norris, BPA, reported there was nothing to report.

The next TMT meeting will be an unscheduled conference call on July 10, at 11:00am, followed by a regularly scheduled TMT conference call on July 12 at 9:00.

**Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES**

July 5, 2017

Minutes: Pat Vivian

1. Introduction

Representatives of NOAA, the COE, Montana, Washington, USFWS, CRITFC, BOR, the Colville and Nez Perce Tribes, Oregon, BPA, and others participated in today's TMT meeting chaired by Doug Baus, COE, and facilitated by Emily Plummer, DS Consulting. Idaho was not present today.

2. Review Meeting Minutes – June 14 and June 21

The facilitator's notes and official minutes for both dates were approved as final. The June 28 minutes and notes will be reviewed at the next regular TMT meeting July 12.

3. SOR 2017-C1 Extension

Another week of treaty fishing is underway, Kyle Dittmer, CRITFC, reported. The COE is implementing the extension of SOR 2017-C1 for Monday-Thursday, July 3-6. CRITFC staff are reviewing catch data and will decide soon whether to request another treaty fishery next week. CRITFC is conducting a net flight today and will send the results to the COE.

Dave Swank, USFWS, asked if there was a response to BPA's request last week that treaty fishing be scheduled from Tuesday-Friday instead of Monday-Thursday as it has been. CRITFC is in the process of polling tribal fishers on the request and will respond soon, Dittmer said.

4. Dworshak Operations

Alfredo Rodriguez and John Heitstuman of the COE Walla Walla office led a discussion of Dworshak operations and review of TDG and temperature management scenarios.

4a. Current Operations Data. Dworshak reservoir is currently at 1597.69 ft elevation. On Friday July 1, at midnight the COE increased discharges from 7 to 9 kcfs through the weekend to counter rising temperatures in Lower Granite tailwater.

4b. TDG Report. Dworshak outflows are now 8.8 kcfs, which is producing TDG levels of 115-118% saturation. The highest levels occur around 4:00-5:00 pm, the warmest part of the day.

4c. Snake and Clearwater Temperatures. Lower Granite tailwater is following a similar pattern, with temperatures ranging from 64-66 degrees F and peaking in late afternoon.

4d. Model Scenarios. Three potential scenarios were posted to today's agenda for TMT's review. The first scenario maintains 9 kcfs discharges and shows that Lower Granite tailwater temperatures would approach the 68 degree limit on July 12-13.

The second scenario calls for increasing to 10 kcfs at midnight tonight which provides some relief in terms of escalating temperatures in the Lower Granite tailrace but would increase TDG levels downstream of Dworshak.

The last option (posted for information purposes only) calls for 11 kcfs discharges starting at midnight tonight. Because this scenario would cause TDG levels to exceed the 121% saturation allowed in the water quality waiver granted by Idaho and the Nez Perce Tribe, the COE doesn't consider it viable unless the Salmon Managers want it. The COE advocates discharges of 10 kcfs for the sake of TDG management.

Paul Wagner asked if the COE would consider releasing 9 kcfs out of Dworshak for the next two days, then 10 kcfs. The COE is concerned that temperatures at Anatone might actually be higher than projected due to increased discharges from the Hells Canyon complex, Heitstuman replied.

Baus asked whether TMT has priorities as far as the Lower Granite temperature/Dworshak TDG management tradeoff. Which should take priority if there is a hot spell? Would the hatchery be supportive of increased Dworshak discharges in order to keep temperatures below 68 degrees F at Lower Granite tailwater, even if that means exceeding the TDG water quality standard?

Both temperature and TDG management are important, Wagner replied. Swank said it's imperative to keep in-river TDG levels under 120%. There was general agreement on 10 kcfs as an appropriate level of discharge to keep both priorities in balance, expected to produce TDG saturation levels of 118-119% according to modeling.

The water quality waiver says that TDG levels are not to exceed 121% saturation, Baus noted. Levels can be up to 121% as an instantaneous reading. Whether 10 kcfs discharges continue for the next week will depend on temperatures.

The hatchery can manage TDG levels of up to 115% in the Dworshak tailrace, Jay Hesse, Nez Perce Tribe, said. Beyond that, fish start showing symptoms of gas bubble trauma. Hatchery crews haven't sampled in-river

conditions since spill increased over the weekend, but will have results soon. Hesse said the hatchery would support maintaining 10 kcfs out of Dworshak as long as TDG levels don't exceed the terms of the waiver.

Heitstuman noted that TDG levels in the Dworshak National Fish Hatchery raceways were 102% when Dworshak discharges were 9 kcfs. The COE will link the hatchery TDG data website to today's agenda. Now that TDG levels are 103% in the raceways and potentially going higher, the hatchery will probably test regularly for GBT symptoms, Swank said. At some point, this level of spill will start to cause bubbles. He asked, would the COE have a problem if limiting outflows at Dworshak to protect fish from GBT causes exceedance of the 68 degrees F limit at Lower Granite? That limit is specified in the BiOp, so the COE would coordinate with the Salmon Managers if the region finds itself facing tough choices in the temperature/TDG tradeoff, Baus replied.

Charles Morrill asked, as TDG rises from 103% to 105% in the hatchery, how quickly do fish respond? They tend to go off their feed at 104-105% TDG, said Ann Setter, COE Walla Walla. As for the long term impacts of going off their feed as juveniles, Hesse said GBT symptoms do not dissipate even after TDG levels drop and the fish resume eating. Research indicates that significant gas bubbles kill tissue, which could affect the fish's life cycle.

The weather in Idaho will only be hot for the next four days, Kyle Dittmer, CRITFC, forecasted. A cooling spell is expected to start around July 9 and last for the next week. Water travel time from Dworshak to Lower Granite is approximately 2-3 days, with temperatures at Anatone as a critical unknown.

Wagner said NOAA initially favored 9 kcfs discharges for three days, then an increase to 10 kcfs, but would favor 10 kcfs tonight in light of lag time and uncertainty regarding flows at Anatone. According to the modeling, Heitstuman said, 10 kcfs releases will probably allow Dworshak to operate within the limits of the water quality waiver, but that will depend on actual conditions.

NOAA, USFWS, Washington, Montana, Nez Perce and Colville Tribes, and CRITFC agreed on a plan to increase Dworshak outflows to 10 kcfs for the next four days and reconvene to decide next steps. **Oregon** was unenthusiastic but didn't object. **BOR** and **BPA** supported the plan.

The COE will therefore increase Dworshak flows to 10 kcfs at midnight tonight, not to exceed 121% TDG in the Dworshak tailwater as an instantaneous reading. USFWS and the Nez Perce Tribe will check with hatchery managers and with Idaho Power regarding Hells Canyon discharges.

TMT will hold a conference call Monday, July 10, to review the effects of four days of 10 kcfs discharges. If temperatures go down at Lower Granite

tailwater in the meantime, the COE will reduce Dworshak discharges to minimize TDG and hatchery impacts, based on daily modeling.

5. Operations Review

5a. Reservoirs. Mary Mellema, BOR, and Lisa Wright, COE, reported.

Hungry Horse is at elevation 3555.4 ft, with inflows of 3.4 kcfs and discharges of 2.3 kcfs. Grand Coulee is at elevation 1286.2 ft. Discharges for upper Snake River flow augmentation will start late this week or early next week. The target remains 487 kaf of summer flow augmentation from the upper Snake projects in 2017. Heitstuman asked how long it takes upper Snake River flow augmentation releases to reach the Hells Canyon complex; Mellema gave a rough estimate of a week or so.

Libby is at elevation 2442.4 ft with inflows of 26.7 kcfs and outflows of 11 kcfs. Albeni Falls is at 2062.2 ft elevation with inflows of 27.5 kcfs and outflows of 31.3 kcfs. Dworshak is at 1597.9 ft elevation with inflows of 3.9 kcfs and outflows of 8.9 kcfs.

Lower Granite outflows are 65.8 kcfs, McNary outflows are 251 kcfs, and Bonneville outflows are 218.6 kcfs.

5b. Fish. Paul Wagner reported.

Adults: Summer Chinook returns to Bonneville are 67,060 to date, and 72,000 for sockeye. The sockeye run probably peaked at 4,500 on June 29, which is typical in terms of the historical trend. A stunning 43,000 lamprey adults returned to Bonneville. McNary has seen 38,000 summer Chinook returns and 41,000 sockeye. However, only 35 sockeye returned to Lower Granite, a reflection of adverse conditions for the 2015 run. Summer Chinook returns to Granite are 5,700 to date. The steelhead run is only about 30% of the 10 year average and is much delayed. Summer Chinook are doing better than spring Chinook, with returns to Bonneville at 70-80% of the 10 year average. Returns are slower upriver.

Juveniles: Subyearling Chinook are doing very well with 155,000 passing McNary to date. Peak passage was 13,000 on July 4. Lower Granite passage is well past its peak, but the numbers at McNary are still increasing.

5c. Water Quality. TDG levels are well within water quality targets, Dan Turner, COE, reported.

5d. Power System. There was nothing to report today.

Next TMT Meeting

There will be an unscheduled TMT conference call at 11 am on July 10 to discuss Dworshak operations in relation to temperature and TDG management. The meeting will be canceled if temperatures at Lower Granite go down. The next regular TMT meeting is a conference call on July 12.

| Name | Affiliation |
|-----------------|--------------------|
| Paul Wagner | NOAA |
| Aaron Marshall | COE |
| Dan Turner | COE |
| Lisa Wright | COE |
| Doug Baus | COE |
| Jim Litchfield | Montana |
| Charles Morrill | Washington |
| Dave Swank | USFWS |
| Michelle Yuen | COE |
| Laura Hamilton | COE |
| Eric Chow | COE |
| Charles Wiggins | DSC |

Phone:

| | |
|-------------------|-----------------|
| Kyle Dittmer | CRITFC |
| Mary Mellema | BOR |
| Sheri Sears | Colville |
| Jay Hesse | Nez Perce |
| Erick Van Dyke | Oregon |
| Alfredo Rodriguez | COE Walla Walla |
| John Heitstuman | COE Walla Walla |
| Shane Scott | PPC |
| Michael Bryant | CBB |
| Mike Shafley | Snohomish PUD |
| Tony Norris | BPA |
| Ann Setter | COE Walla Walla |