

## COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

March 16, 2018

Facilitator's Summary

Facilitator: Donna Silverberg; 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/2018/>*

### Dworshak Operations

Steve Hall, Corps, reported on current and proposed operations at Dworshak. He presented several charts that are available on the TMT web site. Current reservoir elevation is 1473 ft. and drafting, with 7.5 kcfs inflows and 15 kcfs discharge. TDG levels are 122.5% in the North Fork Clearwater River and 104.7% in the hatchery. He pointed out that, after reducing outflow to 15 kcfs, the expected drop in TDG levels did not occur, probably due to temperature and atmospheric pressure. In addition, the NWRFC water supply forecast suggests an expected inflow bump to approximately 15.5 kcfs around March 16, tapering down afterwards. The water supply forecast for April-July is 2.8 maf, which is lower than the previous forecast. Predictions for the next 10 days are showing a bit warmer temperatures, then wetter and colder conditions for the next 3 months.

Steve presented four sets of models of proposed operations, modeling discharges of 14 kcfs and 15 kcfs, using water years 2008, 2011, 2012, and 2014. An unofficial mid-week water supply forecast shows a predicted 3.123 maf year. It also shows the COE will need to operate the reservoir to be at 1445' to intersect the flood control curve. The Corps used STP forecasts, not RCC numbers, for this model run.

After conversation, the group reached consensus on future operations at Dworshak:

- **ACTION:** Reduce discharge to 14 kcfs from midnight March 16 to March 28. Further reduce outflow to 12 kcfs from March 29 to March 31, to support hatchery fish releases. Then increase discharge to 14 kcfs from that date to April 3. Then, increase to approximately 17 kcfs until April 15.
- TMT will continue to monitor, and may adjust the final outflow figure if necessary.

Members were optimistic that discharge operations could be maintained at 14 kcfs for the near future, but that if there were more inflow events, the increased discharges in April would either need to be higher or held for longer to meet flood control requirements.

Dave Swank, USFWS, reported that more fish are off feed in the hatchery, and more showed Level 1 gas bubble trauma in dorsal and unpaired fins. He appreciated the flexibility to adjust for the early releases.

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

**March 16, 2018**

Minutes: Pat Vivian

**1. Introduction**

Representatives of Washington, CRITFC, USFWS, Idaho, Montana, Nez Perce Tribe, NOAA, the COE, BPA, Colville Tribe, Oregon and others participated in today's TMT call chaired by Doug Baus, COE, and facilitated by Donna Silverberg, DS Consulting.

**2. Dworshak Operations**

Steve Hall, COE Walla Walla, gave an update on Dworshak operations in light of the need to manage TDG levels downstream of the dam while meeting flood control targets for the end of March and April 15.

**2a. Hourly Data.** Dworshak reservoir elevation is slightly above 1473 ft with 7.5 kcfs inflows and 15 kcfs outflows.

**2b. Dworshak Hourly Total Dissolved Gas Data (tailrace and hatchery).** Unfortunately, water quality has not improved as a result of reducing Dworshak discharges to 15 kcfs on March 14. Current saturation levels are 122.5% in the river and 104.7% in the hatchery. This is because TDG levels are dramatically affected by temperature.

**2c. NWRFC Dworshak Dam Inflow Forecast.** The River Forecast Center is still predicting a couple of bumps in inflow, the first this weekend to 10 kcfs. The RFC model tends to overestimate runoff volume so the COE is watching this closely. The project continues to draft toward 1560 ft, but a second bump in inflows could make it challenging to draft to 1461 ft by the end of the month. If the current forecast holds, operational adjustments might be needed.

Charles Morrill, Washington, asked whether the operation is planned based on 80% or face value of the observed forecast. In hindsight it does appear that actual peaks are about 80% of the forecast, Hall said, but the challenge this time of year is that snowmelt is highly driven by temperature. Modeling tends to do a poor job of forecasting when the weather warms up and snow melts during the day, then freezes again at night.

**2d. NWRFC Water Supply Forecast.** This forecast hasn't changed much. The RFC is still saying 2018 is going to be a 2.9 maf year at Dworshak in terms of April-July runoff.

**2e. NWRFC Climate Forecast.** There are no changes to the longer range forecast since TMT met on March 14. There's a higher probability of colder than normal temperatures and wetter than normal conditions, especially over the next 90 days.

**2f. Photos.** Hall shared several photos that were taken during the recent snow flight, with researchers' snowshoe tracks forming a dotted line through pure white drifts to the SNOTEL station. They measure snow water content by plunging a tube taller than a man into the snow and weighing the core sample it extracts.

Hall also shared photos of the Dworshak unit 3 rehabilitation in progress. The 504 stator bars have all been reinstalled and are now being braised and lashed together. This time-consuming process must be done with extreme precision. When the turbine is spinning the bars are drawn toward the magnet, so they need to be fastened rigidly in place. The 40 ft rotor shaft connecting the rotor and turbine has to be vertically aligned within .0001 inch from top to bottom. This is extremely precise work.

**2g. Dworshak Operational Scenarios.** Hall presented two scenarios for each of the four analog years, using the STP forecast to model the effects of 14 kcfs out vs. 15 kcfs out through April 1:

- Based on inflows in 2008, a drop to 14 kcfs discharge would require an increase to 17 kcfs to reach the April 15 flood control elevation. Alternatively, discharges of 15 kcfs could be held through April 7 or 8, followed by an increase to 16 kcfs to reach the April 15 flood control elevation.
- Based on inflows in 2011, a drop to 14 kcfs discharge would require an increase to 16.5 kcfs for the first 7 days of April, then another increase to 17 kcfs to reach the April 15 flood control target. Discharges of 15 kcfs could be held through April 8 or 9 followed by a brief increase to 16 kcfs.
- Based on inflows in 2012, Dworshak operation wouldn't change much. Dropping to 15 kcfs now would require an increase to 16 kcfs starting April 1.
- Based on inflows in 2014, a drop to 14 kcfs discharge now would require an increase to 17 kcfs for the first half of April. A discharge of 15 kcfs would follow the same basic pattern.

While the STP traces on which these models were based does present an average shape overall, STP traces tend not to be very representative of actual inflows, Hall said. It appears that Dworshak discharges can be reduced to 14

kcfs for a while as requested today, but if the RFC forecast is correct and inflows rise over the next 10 days due to increased precipitation, Dworshak discharges will also need to increase.

The mid-month water supply forecast for April-July is 3.123 maf, keeping the April 15 flood control elevation at 1445 ft, where it must remain until the flood control curve intersects the refill curve.

Erick Van Dyke, Oregon, asked why the STP forecast was used for these models instead of the RFC forecast, which was used for the models presented to TMT on March 14. Aaron Marshall, COE, said he requested use of the STP traces to capture volatility in the runoff forecast over the next 10 days, although the STP traces tend not to predict spikes in inflow over the long term.

At this point Paul Wagner, NOAA, reported FPAC's consensus recommendation: Reduce Dworshak discharges now from 15 kcfs to 14 kcfs until TMT meets again March 21. FPAC's first priority is to increase steelhead feeding activity in preparation for an early release on April 2. The Salmon Managers recognize that this action implies a greater risk of increased inflows over the long term.

The RFC 10 day forecast is for cooler conditions, and precipitation might come off as snow, Wagner said. After 10 days, temperatures are forecasted to increase but not necessarily precipitation. If this forecast materializes, a decrease in discharges to 12 kcfs on March 28-29 (and potentially March 31) would be desirable for the early releases.

Dave Swank, USFWS, said Dworshak hatchery staff published a fish health report yesterday. This is the second week fish are off their feed at a higher rate than usual. The frequency of gas bubbles in the unpaired fins is increasing, and more fish had bubbles in the lateral lines. While these were all rank 1 bubbles, the fact that fish are going off their feed is concerning.

Swank said his thinking on this has changed since TMT last met on March 14, when he was mainly concerned about exposing the steelhead in systems 2 and 3 to TDG levels created by 20 kcfs discharges. Ideally, Dworshak would keep discharges down to 14 kcfs until the steelhead are released on April 2. After that, discharges could increase, although that wouldn't necessarily be good for wild juveniles. Ann Setter, COE Walla Walla, supported the USFWS proposal to hold 14 kcfs out until the steelhead in systems 2 and 3 are released.

At this point, the COE took a brief break to model the request for 14 kcfs out until April 2 based on the current 10 day weather forecast.

During the break, Julie Ammann asked the Salmon Managers to consider whether holding 14 kcfs out through April 2 would be a higher priority than decreasing discharges to 12 kcfs for the release dates on March 28-29 (and possibly March 30).

**USFWS** said that 14 kcfs out through April 2 is a higher priority than 12 kcfs out for the 2-3 days of early releases at the end of March.

**Idaho** agreed with USFWS that 14 kcfs out for the steelhead release on April 2 is a higher priority than 12 kcfs out for the early releases. However, if dropping discharges to 14 kcfs doesn't reduce TDG levels and fish are still being impacted, it would be preferable to reduce discharges to 12 kcfs for the early releases.

The **Nez Perce Tribe** agreed with this summary of priorities, and there were no objections to it from any TMT members present.

Jay Hesse reported that flows in the mainstem Clearwater were low enough a week ago to allow beach seining, which is unusual for this time of year. Researchers were able to sample a few fall chinook subyearlings that have hatched and are starting to rear downstream of the North Fork to the Peck gage. None of these fish showed signs of GBT.

After running the Salmon Managers' request for 14 kcfs discharges until April 2 through the model, Hall confirmed it would be possible to drop discharges to 14 kcfs and provide 12 kcfs discharges at the end of March for the steelhead releases, while still meeting the end of March flood control target. This is based on current conditions and 10 day STP weather and streamflow projections.

The model indicates that after April 2, discharges would need to increase to 17 kcfs to meet the 1445 ft April 15 flood control requirement. If discharges drop to 14 kcfs starting tonight through March 28, there would be 3 days of 12 kcfs out, then 2 days of 14 kcfs out, followed by 3 days of 12 kcfs, 2 days of 14 kcfs, and finally 17 kcfs from April 3-15.

Steve Hall cautioned everyone that inflows will probably exceed the STP traces in that timeframe. At present the COE is willing to drop discharges to 14 kcfs and possibly 12 kcfs at the end of March, but there's a distinct possibility that discharges will need to be higher than that.

**NOAA** expressed regret at the prolonged release of 17 kcfs under this scenario but said it would be acceptable under the circumstances.

**Oregon** asked whether the rule curve on April 15 might change. That's possible because it's hard to predict the weather that far in advance, Hall

replied. While 1445 ft is the deepest that Dworshak reservoir can draft, discharges might need to increase if inflows rise. If the weather dries out and the water supply forecast goes down, the April 15 flood control elevation would be higher.

Hall reiterated the operation as requested: 14 kcfs through March 28, then 12 kcfs out from March 29-31, followed by 14 kcfs out on April 2, and whatever discharge is needed after that to meet the April 15 flood control elevation. The water supply forecast should be available in the first 2-3 days of April and will be on the April 4 TMT meeting agenda. It would take a water supply forecast of less than 3 maf to change the current outlook.

### **3. Next TMT Meeting**

TMT will meet next on March 21 in person, followed by a process meeting.

<b>Name</b>	<b>Affiliation</b>
Charles Morrill	Washington
Tom Lorz	CRITFC/Umatilla
Dave Swank	USFWS
Russ Kiefer	Idaho
Jim Litchfield	Montana
Jay Hesse	Nez Perce
Charles Wiggins	DS Consulting
Doug Baus	COE
Paul Wagner	NOAA
Aaron Marshall	COE
Laura Hamilton	COE
Michelle Yuen	COE
Julie Ammann	COE
Steve Hall	COE Walla Walla
Alfredo Rodriguez	COE Walla Walla
John Roberts	COE Walla Walla
Ann Setter	COE Walla Walla
Tony Norris	BPA
Sheri Sears	Colville Tribe
Erick Van Dyke	Oregon