COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
March 15, 2023
Facilitator's Summary
Facilitation Team: Emily Stranz & Colby Mills, 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; it is not intended to be the "record" of the meeting. Official minutes can be found on the TMT website: http://pweb.crohms.org/tmt/agendas/2023/. Suggested edits for the summary are welcome and can be sent to Colby at colby@dsconsult.co.

Chum Operation – Doug Baus, Corps, reported on current hourly data at Bonneville Dam. Total outflow at 0700 hours was 120 kcfs, with a project tailwater elevation of 11.5 feet.

The NWRCF inflow forecasts for Bonneville Dam over the next 10-day period are relatively low, ranging from a low of 103 kcfs on March 15, to a high of 109 on March 20. Looking ahead, the 120-day forecast shows low inflows. Starting in April, 50% climatology is 181 kcfs at Bonneville Dam, and April 1 is currently forecasted to be 112 kcfs (below the 90% climatology value of 134 kcfs). While the forecasted precipitation in the region shows some variability, in the Columbia River basin, the 10-day and 5-day QPF both show well below average precipitation.

Doug reviewed the monthly precipitation table for March, noting that this month has seen above average precipitation values. The Snake River above Ice Harbor Dam (observed month to date) is 180% of normal, and the Columbia River mainstem above The Dalles is 137% of normal. This monthly precipitation is not enough to get out of the current Water Year deficit, as the observed precipitation across the Water Year (October 1, 2022 to current) is still below normal conditions. The Snake River above Ice Harbor Dam is 89% of normal, and the Columbia River mainstem above The Dalles is 78% of normal.

The 6-10-day temperature outlook shows a probability of below average temperatures and variability in precipitation: a probability of near normal in northern Washington, Idaho, and northwestern Montana, and a probability of above average precipitation in the southern Columbia River basin.

Doug reiterated that the current tailwater minimum at Bonneville Dam is 10.2 feet for the chum operation, and, unless otherwise coordinated at TMT, this will continue through April 9 at midnight. Spring spill will begin on April 10.

Tony Norris, BPA, reported results from the March 9 water surface survey data ("2022 Chum Redds and March Water Elevation," posted on the TMT website). The survey gave a snapshot of downstream water surface elevations during an average tailwater of 10.5 feet at Bonneville, to help identify which redds are above or below surface water. The location of redds were marked on December 2, 2022, at McCord Creek, Breaks, Ives Pocket and Channel, Woodard Creek, and the Hamilton Creek area. Tony noted that many redds are still under the water, and some are not. Charles Morrill, WDFW, noted that updates on emergence out of Hamilton Springs are still coming and he will update the TMT when it becomes available. Tony reported that the WDFW staff member on the survey trip noted that they generally count about 10,000 fry coming out of Hamilton Springs per day. At a 10.5-foot elevation, there are good egress conditions from Hamilton Creek to the river; egress is expected to be good if there is 1-1.5 feet of water above the gauge.

Tony clarified that in terms of water elevation, each data point location has a timestamp and corresponding instantaneous average Bonneville tailwater hourly reading, and that data are looking at

relative submergence. Additionally, the aerial photos used in the presentation are not reflective of the day data were taken.

Questions and Comments from TMT Members:

- Jay Hesse, Nez Perce Tribe, asked how the Willamette flows may have affected elevations at the time of the survey?
    - Tony responded that the minimum Bonneville tailwater is 10.2 feet, but the project is operated above that to manage for uncertainty (generally in the 10.4-10.5 feet range). Willamette flows help reduce the amount of water that Bonneville needs to release to achieve a specific tailwater downstream of the project. The combination of additional incremental stream flows, with the slight rise in Snake River and increased Willamette flows reduced the amount that Bonneville needed to release to achieve a tailwater elevation and provided a boost for a period of time. However, the Willamette is likely to drop back down.
- Dave Swank, USFWS, asked for information on the chum emergence timing over the season in the Ives Island area. Has there been any fry trapping?
    - Tony responded that temperature units were collected in 2018 and 2019 and can provide a representation of temperatures in the area. There may be PNNL reports from TMT in 2004, 2005, 2006 that could shed some light.
    - Charles noted that egress from Hamilton Springs would largely depend on flow from Hamilton Creek; Charlie will ask internally for more information.
- Kirk Truscott, Confederated Tribes of the Colville Reservation, noted that maintaining the chum flows and Vernita Bar flow may come at a cost to Grand Coulee refill and late April and early May flows in the Columbia River extant anadromous zone. Grand Coulee will be below the drum gate maintenance elevation and far below the FRM. Kirk was concerned that there will be very low flows throughout the Columbia at the end of April and beginning of May, which could negatively affect Columbia River flows in the extant anadromous zone during April and May as Coulee refills to the July refill target.
    - Tony noted that the recent higher tailwater at Bonneville is a result of increased Willamette and Snake flows, and other incremental discharges; together, these flows reduced the flow rate needed at Bonneville, and eased the draft at Grand Coulee. Aside from that, the AAs still expect to augmenting with flow from Coulee to achieve the Hanford Reach minimum of 60 kcfs for Priest Rapids, which is a high priority for the region. Additionally, the AAs expect to refill Lake Roosevelt; this does come at the expense of lower spring flows that my affect juvenile fish moving in the river at that time.
    - Charles noted the conundrum; while lower flows can allow for better (lower) PIT powerhouse passage in the mainstem Columbia, they also result in slower travel times.
- Tom Lorz, Confederated Tribes of the Umatilla Indian Reservation/CRITFC, noted his concern that preparing for Grand Coulee drum gate maintenance put the project below FRM, and wondered if the maintenance elevation could have been started earlier when the elevation was low enough on March 1st.
- Jonathan Ebel, IDFG, questioned if spring flows can be improved by managing down to the Vernita Bar minimum at this point?
    - Tony responded that managing to Vernita Bar could help, but that they are already operating pretty close to it. The AAs are managing to not draft below 1,240 feet by April 10, while balancing the use of the recent advantageous precipitation. They expect to transition to only Vernita Bar, hopefully the contribution from the Snake continues. Dropping to Vernita Bar would drop Bonneville tailwater and impact chum.
- Joel Fenolio, Reclamation, added that Grand Coulee ramping rates (to avoid landslide issues on Lake Roosevelt) required the pool to be lowered this spring, in addition to drum gate maintenance

needs. He said that a lot of dams in the basin are currently operating to minimum flows, in part to support environmental purposes (mitigating low stream flows). This year's conditions could be an opportunity to reevaluate the approach for when to start chum spawning operations.
    - Regarding an update on the drum gate maintenance schedule, Joel said that the work is estimated to take 6-8 weeks.
- Charles noted that regarding chum egress from the spawning areas, peak rate of emergence starts now and goes almost into April; any boost in flows is helpful during this time.
- Erick Van Dyke, ODFW, remains concerned that fish mitigation is not being retained in the same way that full flexibility is being maintained for power and operations. Erick was interested in the expected error for the instrument used for data collection.
    - Tony noted that the instrument is very accurate, and calculations were made to account for the different datums used at the dam and the survey elevations. Facilitator, Emily Stranz, suggested any follow up regarding the datum be discussed in a side-call.

Water Quality Update – Dan Turner, Corps, provided an update on current water quality conditions, noting that the Oregon State water quality standard of 105% TDG (for shallow waters) has been exceeded for the last 6 days at Warrendale. Yesterday, the maximum value reached 108%. The Corps has reached out to OR Department of Environmental Quality (DEQ) to seek clarification on the application of 105% criteria (when and where it applies). DEQ is looking into the issue but has not yet provided a response. Dan reminded the TMT that Oregon's TDG standard modification begins on April 1.

Dan provided a summary to the TMT, noting that references to applications of the 105% criteria were found in TMT notes from the 2000s and 2010s. The reasons it applies this year include low tailwater issues occurring earlier in March than in the past, and the B2 corner collector opening earlier in March due to new criteria in the Fish Passage Plan. Major sources of TDG include upstream TDG coming in (influenced by barometric pressure, water temperature, instream productivity), and sources at Bonneville Dam including the B2 corner collector, spill from bays 1 and 18, and the ice and trash sluiceway. Dan saw a clear signal between the B2 corner collector and TDG at the Warrendale gauge, with a lag time of about 4-6 hours after the collector operation, spiking TDG 2-3%. He also observed that a high pool operation at Bonneville over the weekend seemed to increase TDG at Warrendale. A pattern between TDG concentration and Bonneville tailwater elevation was less clear.

As TDG has not decreased following the recent high pool operation, the Corps plans to introduce a new low pool operation in the Bonneville pool with a maximum elevation of 74 feet (soft constraint), with the intent to reduce flow through the B2 corner collector, spill bays, sluiceway (therefore reducing TDG), and also increase dilution at the Warrendale gauge. The Corps will move forward with a soft forebay constraint, noting that it will not result in turning off or modifying fish passage facilities, and is a prudent step in reducing TDG. Dan welcomed any TMT feedback or questions.

TMT Discussion

- Jonathan wondered why the height of the daily trough in TDG is rising? The actual difference between peak and background is not changing in this scenario. He also noted that the Warrendale gauge is between 5-6 feet below water surface.
    - Dan believed this is due to the upstream TDG coming in, likely driven by changes in barometric pressure and water temperatures.
- Trevor Condor, NOAA, was comfortable with the modifications within the scope of the FPP and the Corps' discretion. However, NOAA would be concerned with any modifications impacting the FPP operations. Trevor questioned whether the 105% standard applies, when, and if it is used as a soft or hard constraint. NOAA would like further discussion and clarification. A delay in response from DEQ could impact FPP and BiOp operations.

- Dave asked when the language in the ODEQ standard (less than 2 feet, 105%) was incorporated into the rule?
    - Dan thought it might be from the early 2000s.
- Erick asked if there were any issues with the gauge efficiency at Warrendale, pointing to concerns with sediment in the past. He also sought clarity as to whether the Warrendale gauge represents an "off-channel area nearby 2-feet deep" or not, noting that this needs to be discussed more in detail with DEQ before approving an action that alters planned fish mitigation.
    - Dan noted that he can reach out to USGS, who runs the Warrendale gauge. He noted that the gauge is well-monitored, and no issues have been brought up to the Corps. He also noted that USGS publishes their gauge data.
- Jonathan noted that there is an atypical spill pattern at Bonneville for this time of year that may be contributing to this issue.
- Erick asked if Bonneville was being managed under normal operations according to the FPP or if maintenance work for erosion around the fish ladder is still underway.
    - Doug noted that the Corps complies with its WQS and is implementing planned operations that are shared through the FPOM process (MOC is published).
- Charles echoed NOAA's concerns, and reiterated that more conversation needs to happen. He noted appreciation for the Corps' efforts in reaching out to DEQ and looks forward to a clarifying response. Charles added that some redds are 6-12 inches below the surface, and there is some natural reduction in TDG when going deeper.

Multiple TMT representatives stressed the need for quick clarity on the DEQ water quality standard, and whether it applies in this situation. Dan acknowledged concerns raised by TMT partners and will continue to work to clarify with DEQ as requested by the TMT; he will report back to TMT once they have a response.

- **Action: The Corps will reduce the Bonneville Dam forebay elevation as a soft constraint. Once a response is provided by DEQ, the Corps will implement any compliance requirements and notify the TMT**.

Question and Comments from members of the public – There were no questions or comments from members of the public.

The next scheduled TMT meeting is on March 22, 2023 at 9:00 AM.

Columbia River Regional Forum
Technical Management Team
OFFICIAL MINUTES
Wednesday, March 15, 2023
Minutes: Andrea Ausmus, BPA (contractor, CorSource Technology Group)

Today's TMT meeting was held via conference call and webinar, chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. A list of today's attendees is available at the end of these minutes.

1. **Chum Operation –** ***Doug Baus, Corps-NWD; Tony Norris, BPA; Joel Fenolio, BOR, and; Kelsey Swieca, NOAA Fisheries***

   a. Bonneville Dam - Hourly Data – *Doug Baus, Corps*
   (Hour ending 7)

   - Total Project Outflow: 120 kcfs
   - Project Tailwater Elevation: 11.5 feet

   b. Bonneville Dam – NWRFC Inflow Forecast (10-Day)

   - Low: 103 kcfs (March 15)
   - High: 109 kcfs (March 20)

   c. Bonneville Dam – NWRFC Inflow Forecast (120-Day)

   - Low inflows over next 120-day period.
   - April 1
     - 50% climatology: 181 kcfs
     - Current forecast: 112 kcfs (April 1)
     - 90% climatology: 134 kcfs

   d. NWRFC Forecasted Precipitation Summary

   - Variability with precipitation forecast
     - 10 Day QPF: well below average
       - Not a lot of precipitation in the Columbia Basin
     - 5 Day QPF: well below average

   e. NWRFC – Monthly Precipitation Table

   - Snake River Basin– above Ice Harbor Dam
     - Observed (MTD): 1.92 in.

- 180% of Normal
- Columbia River Main Stem – above The Dalles
  - Observed (MTD): 1.65 in.
  - 137% of Normal

f. NWRFC – Water Year Precipitation Table (October 1 – March 14)

- Snake River – above Ice Harbor Dam
  - Observed: 11.4 in.
  - Normal: 12.8 in.
  - 89% of Normal
- Columbia River Main Stem – above The Dalles
  - Observed: 12.4 in.
  - Normal: 16 in.
  - Departure: -3.5 in.
  - 78% of Normal
- Precipitation for the month of March has been above average but from a water year standpoint it is still well below average.

g. NWRFC Climate Forecast

- 6-10 Day Forecast
  - Probability of below average temperatures
  - Variability in Precipitation
    - N. Washington, N. Idaho, NW. Montana: Probability of near normal
    - Southern Columbia Basin: Probability of above average

h. Current 2022/2023 TMT Coordinated Chum Operations

- Effective Thursday, March 2, 2023, at 0001 hours, until further notice, the Bonneville Dam minimum tailwater elevation is 10.2 feet during all hours.
- If unable to maintain a minimum tailwater of 10.2 feet with the available water on any day, operate to the highest flat discharge possible.
- Continue through April 9 at midnight. April 10 will start spring spill operation and chum operation will end.

i. 2022 Chum Redds with March 9, 2023 Water Elevation – *Tony Norris, BPA*

- Survey: March 9
  - Average Tailwater: 10.4 – 10.5 ft.

  - Collected a lot of data to document water surface across typical spawning areas
  - It was the first time that we have taken a close look at the water surface in the Ives area when the Bonneville's tailwater is at 10.5 ft.
  - Data were collected to follow the water surface at small intervals so that they could identify which redds were above/below the water surface.
- McCord Creek
  - Most redds were underwater, there were a few above.
  - In new pocket area, there are a few mounds of gravel with a few redds above the water surface.
  - One of the redds identified on December 2, 2022 was not in the best location but it is currently underwater with the recent precipitation and Bonneville tailwater.
  - The propensity of the redds are still under water and in the river.
- Breaks
  - There are locations that fish spawned above the water surface.
  - They are spawning in expected locations.
  - A few of the redds were impacted by the lower tailwater.
  - The propensity of the redds were still in the river.
- Ives Pocket and Channel
  - Redds were impacted in the pocket and channel.
  - Ives Pocket
    - Ives Pocket is wet with many seeps; there is no way of knowing if the chum in these redds have emerged yet and may have been impacted.
    - There is water in the gravel in the Ives Pocket area.
    - Any increment above 10.5 will benefit chum still emerging.
    - Many of the redds are still covered in water.
  - Ives Channel
    - Some redds are in wet areas but some are above that.
    - The redds that are impacted have no obvious signs of upwelling.
    - Remaining redds on fringe still have water or are in the channel itself.
    - There is a slope to the water surface in the Ives channel, those redds in this area are likely still submerged.
    - Hamilton Creek flow was measured 1.2 feet over gauge.
- Woodard Creek
  - All redds are below the water surface.
  - Submergence on December 2, 2022 was significant.
- Hamilton Creek Near Mouth at N Bonneville

  - 1.2 ft. over the gauge, yesterday (March 14, 2023) afternoon there was still peak flow. Excellent egress exists for any fish coming out of the springs and the creek.
  - March 9, 2023 water was only coming from Hamilton Creek.
  - Good conditions for fish egress.
- Break upstream of Hamilton Creek.
  - No chum redds identified in this area but if they were any redds in this area there is a path for egress.
- 2018-2019 Ives Buoy Cumulative Day Average Degree Days
  - Measured Hyporheic Temperatures and River Temperatures.
  - Achieved 1000 TUs beginning of February and middle of March – typical.
- Graph from "Notes from Todd Hillson and Brad Garner"
  - 2011-2019 Chum emergence timing out of Hamilton Springs and other tributaries.
  - Fry collection
    - End of March still well into the steep curve for emergence.
- Impacts of Lowering Tailwater to 10.5 feet.
  - Previous assumptions of complete desiccation were not accurate, a large percentage of the redds are still covered.
  - Continued good egress conditions out of Hamilton Creek.

Charles Morrill, WA, thanked Norris and crew for providing insight and information of observations and measurements. He has still not received any updates out of Hamilton Springs. When he receives them, he will provide the information to the TMT webpage.

Norris said that the Fish and Wildlife crewmember noted that they typically count ~ 10K fry per day out of Hamilton Springs.

Trevor Conder, NOAA, asked about the traces of the tailwater elevation (10.3 or 10.5 ft).

Norris took the time stamp and noted the Bonneville tailwater reading for that hour. For each graph, he took the average for the tailwater at Bonneville for the time stamp.

Conder said that the elevation looks higher than the Bonneville tailwater.

Norris said to look at the relative submergence because the data taken is on the NAVD88 datum, the Bonneville tailwater is on the 1929 datum – add 3.1 feet to the Bonneville number to adjust the tailwater to the NAVD88 datum. There is a gradient. Norris left the Bonneville tailwater as 1929 because it is what TMT is familiar with and there is a strong correlation between the Ives water surface elevations at a specific tailwater.

Conder asked about the image for the area not matching the elevations listed.

Norris said that the images are from an aerial photo available to him. He picked the one that represented the closest match. The image is not necessarily applicable to the current year. At 10.5 feet, the water was a few tenths of a foot from flowing over the bar. The

photos and data showed that at 10.5 there are good egress conditions from Hamilton Creek Even at a lower tailwater elevation, if Hamilton Creek is flowing with a 1 – 1.5 ft. over gauge there are possibilities for egress. He added that there are things that they had learned that should be talked about at a future process meeting.

Jay Hesse said that this is at a 10.5 tailwater but we have been at a 10.2. He asked what the few tenths of an inch difference could mean versus the 10.5. He also asked about the influence of the Willamette flows. He wanted to know what the conditions were on the Willamette and how that influenced the conditions.

Norris said that the minimum tailwater is 10.2 ft. but they need to operate above that point to manage for uncertainty. They are generally above that but one to two-tenths of a foot, 10.4 - 10.5 feet.

Willamette crested at 35 kcfs. It was forecasted at 45-50 kcfs. but that has not presented itself. The more water from the Willamette means that it reduces the amount of water that Bonneville needs to put out to achieve a specific tailwater downstream of Bonneville Dam. With the same amount of flowrate out of Bonneville, if there is a higher Willamette flow then it will provide a higher tailwater. The flowrate forecasted for Bonneville has come up due to a rise at the Snake (up to 115 kcfs). It provided a tailwater of 11.5 – 11.7 feet. There is a dry forecast over next few days, but temperatures are below average. He hopes that there will be a sustained increase from the Snake but he does expect Willamette to drop so it will reduce the bonus influence from the Willamette.

Dave Swank, USFWS, asked about the emergence timing over the season.

Norris reminded Swank that this is not a chart of emergence but rather TUs collected at a single spot in 2018 and 2019. It cannot be verified that the water temperature experienced at that location is experienced at all locations. It is a representation of what may be seen in the area.

Swank asked how it would correlate to the notes on Chum emergence timing.

Norris said that the graph shows only migration timing and does not include temperatures. It only include Hamilton Springs and Duncan Channels. He also mentioned that the emergence timing and egress conditions for a fish in the springs might not be the same for the fish in the river; where they would likely be immediately swept downstream.

Swank asked Morrill if there has been fry trapping on Ives Island.

Morrill said years ago they did fry trapping on Ives island years ago. He is not sure about whether that information would be useful for the timing out of Hamilton Springs or Duncan. Both physical sites are different from where the traps are located. He believes the egress from Hamilton Stream will depend on current flow over the gauge. He is not believe that there is information that would be able to answer Swank's question.

Norris said that the question is what prompted temperature collection in the early-2000s. There were a several years with multiple piezometers collecting temperature information.

Kirk Truscott, Colville, said that he appreciates all the information on chum. He also can appreciate the concern for Chum but maintaining the Chum operation comes with a cost

and we are digging a hole in Grand Coulee for Chum flows and Vernita Bar. According the latest STP it is well below the drum gate maintenance and way below the FRM. He foresees a continued concern of low flows in the Columbia, including the Upper Columbia, into the latter two weeks of April and the first two weeks of May as they try to catch up so they can reach the refill target in July. It has the Colville Tribe concerned.

Norris noted that we have been able to achieve a higher tailwater for the current operation of 10.2 ft. by taking advantage of the increased Willamette flows to reduce the flowrate required out of Bonneville and increases in the Snake River and other incremental discharges. As the Snake River comes up and they are able to offset the needs from Grand Coulee that still expect to be augmenting to achieve the Hanford Reach minimum, 60 kcfs Priest Rapids. With inflows to Coulee being low, the Hanford Reach objectives would still draft Grand Coulee. Still expecting to stay about 1240 ft. but they still expect to refill Lake Roosevelt.

Truscott said that he understands but he still believes that they are digging a bigger hole than ordinary given the water year. The flows in April and May will need to be used to catch up to the refill curve and there are lower flows in the Upper Columbia. He is concerned that there are juveniles in the system that would benefit from higher flows.

Norris agreed that it comes in expense to lower spring flows.

Morrill shared that there is a conundrum but there is a balance. Powerhouse passage is generally lower with lower flows, less water is going through the turbines. The flipside is that it equates to slower travel times. Morrill hears Truscott's concerns. He noted that with a normal low flow year this would be the situation anyway.

Tom Lorz, Umatilla/CRITFC, agrees with Truscott that we are in a bad situation. He wanted to remind the group that one of the key driving factors is because of the required drum gate maintenance for the emergency repair of the seals. It is already well below the FRM. He said that TMT decided as a group to impact Chum to lessen the impact. He said that it is unfortunate that drum gate maintenance happened as it is not an ideal year for it but it happened, so they are dealing with it. He feels that the other environmental impacts are not helping the situation, but the drum gate maintenance is the largest contributor to the problem and TMT will need to deal with it the best we can.

Jonathan Ebel, ID, said that Morrill should be careful applying some of the concepts of PIT-PH in the Upper Columbia. He is not sure that the patterns hold true up there. He agrees that TMT cannot blame the chum for this; maintenance is a large driver as well as a deviation from the forecast, which is always a risk. He asked Norris or Joel Fenolio, Reclamation, if to get to flows in the spring (current daily average is 65 – 64 kcfs) is there anything gained by going to the Vernita Bar minimum.

Norris responded that they can, but they are managing to not draft below 1240 ft. by April 10 to thread the needle to take advantage of the precipitation, running close to Vernita Bar and trying to stay above 1240 by April 10. Ideally, there will be some contribution from the Snake and then there will only be the need to manage outflow from Grand Coulee to meet Vernita Bar. Average temperatures are creeping up and he expects to transition soon. If they stopped targeting 10.2 and just run to Vernita Bar, it could

drop the tailwater and would impact more chum. He felt that as he showed earlier that keeping to the 10.5 ft. the chum is not impacted as much as originally thought.

Ebel said he understands that fish are on the line. He wondered if operating to the Vernita Bar minimums now, dropping flows out of Coulee by 5, would it be operating 1:1?

Norris said that it would not necessarily be 1:1, would be some to be gained but the increases in streamflows have leveled off. During this event, they have not drafted more than a couple of tenths. It is a short-lived situation and there are still chum emerging.

Fenolio reminded everyone that it is not only drum gate maintenance. Many of the dams in the Columbia River Basin are operating to minimum flows. The dams are being drafted lower because of the low stream flows. He thinks there should be a more pragmatic approach to chum operations; instead of starting on a fixed date wait until chum move up or lower the protection level to save water. The full February operation was to support chum and that drafted a significant amount of the dam.

Morrill said that Ebel was correct about the Mid-Columbia River but Morrill was talking about the Columbia Main stem. He reiterated Ebel's response of slower water times not being as beneficial for the fish in the Upper Columbia.

Lorz asked about Grand Coulee's drum gate maintenance schedule to plan for spring refill. He hopes that it will not take all eight weeks. Lorz asked if it was necessary to be down by March 1 because the dam maintenance was not started until March 15. He said that in the future it should be considered what the requirement is to be down to certain levels for the work needed. Lorz felt that the dam was drafted too early for work that did not begin until recently. He said that it is possible that if they had waited then there would not have been the need to draft as much. He believes that drum gate has a bigger part to play in the situation.

Fenolio said that when they asked for the flexibility in the past it was not given to them. He said that Grand Coulee was not at 1255' on March 1 it was at 1258' and above. They generally try to target being at 1255' and above by mid-March. Fenolio pointed out that this is an odd year because of the low stream flows and they were lower than a typical March.

Stranz said that there are opportunities for conversations and look backs to talk about specifics of when to start the chum operations. These should be looked back at process meetings and year-end review.

Fenolio said that drum maintenance schedule is 6-8 weeks. They are potentially looking to get pulled down to 1245'. They will try to turn around and refill as much as possible.

Morrill added that the chum emergence slide shows that the peak rate of emergence starts now and into April. He and Washington would appreciate protecting the 10.2 range (10.4 -10.6 operating range) for protecting Chum egress from spawning areas.

Van Dyke said thank you about all the chat about the issues. He hears that fish mitigation is not being retained in the way that full flexibility is used for power and operation. Rather than be disagreeable he made the statement without angering anyone. The point of the conversation is using information is not reflecting low tailwater. The charts occurred

with mitigation actions for chum. Van Dyke is not sure about the curves being applicable for the situation as it is now. He added that the information of the temperature units is not enough as the viability of the Redd relies on more than temperature. For Chum oxygen content is important. Van Dyke is concerned seeing people walking in areas that the Redds were. Van Dyke asked about the Ives Channel diagram. He noted the oddity of the datum of about sixth-tenths of a foot difference in a similar space. He asked if there is an expected error around the instrument.

Norris said that the instrument is incredibly accurate. He is not sure about the discrepancy elevation that Van Dyke is referring to as it relates to the measurement error. Measurement error is minute in comparison to what they are measuring.

Van Dyke believed that Norris' datum showed a positive bias.

Norris shared that there is no bias, it is just a datum (federal projects use 1929 datum) the rest of the world use the modern datum, NAVD88. The instrument reads the most current datum. The measurements are in the new datum. The data show absolute submergence, so focus less on the value of the numbers and more on the difference of the numbers. He is using the water surface adjacent to the Redds to determine the submergence of the Redds, the notation of the Bonneville tailwater is there to show what the tailwater correlates to the submergence of the Redds in the Ives-Pierce area.

Stranz asked if this would be better for a one on one conversation between Norris and Van Dyke later.

Swieca said thank you for the data, it is are not perfect, but she looks forward to the emergence data. NOAA approves of the data and the presentation.

2. Water Quality Update – *Dan Turner, Corps*

a. Current Conditions

- TDG standard of 105% exceeded at Warrendale for last 6 days.
- The Corps reached out to Oregon DEQ to seek clarification for application.
    - Specifically they want information for when and where it applies.
    - Oregon DEQ is looking into it but there has not been a response as of yet.
    - Oregon TDG standard modification kicks in on April 1 (10 days before spring spill starts)
    - Looked back at old notes for the TDG criteria (2000, 2010)
        - Few years for concerns of 105% (First time for Dan Turner – 2017)
        - Low tailwater and it is earlier in March.
        - Early opening of B2 Corner Collector (typically closer to the end of March)
        - Looked through literature – PNNL studies but did not find any plain language to interpret the 105% in current situation

b. Warrendale Hourly TDG

- Click on link at any time and will update with the most recent data.
- Two major sources:
  - Upstream TDG
    - Cycle in February up and down – influenced by barometric pressure, water temperature, and instream productivity
  - Bonneville Dam
    - B2 Corner Collector
    - Bays 1 & 18
    - Ice/Trash Sluiceway

c. WRNO TDG BON ops

- Bonneville Flow
  - Misc. flow – sluice way (green line)
    - 2 – 4 hour blocks
  - Total spill at project (black line)
    - Last week steady spill from Bay 1
    - Currently, Bays 1 and 18 operating at daylight hours (daily cycle)
  - TDG at Warrendale (Purple lines)
    - Hourly TDG (variable purple)
    - Hourly Max TDG of each day (thicker purple line)
    - There is a clear signal between B2 corner collector and TDG at Warrendale gauge. Lags 4-6 hours.
    - Spike at Warrendale gauge 2.3%
- Forebay elevation
  - High pool operation over weekend to support the hydro
  - As forebay elevation goes up TDG at Warrendale increased.
  - Yesterday highest concentrations of TDG coincided with highest elevation of 74.5 ft.
- Tailwater elevation at Bonneville
  - No clear pattern emerging.
  - Lower elevation may not allow bubbles to go so deep.
- High pool operation has not helped with TDG
- Low pool operation with max pool elevation of 74.0 ft.

- Reduce the flow through the TDG sources.
- Increase dilution at the Warrendale gauge.
- Will move forward and not turning off the fish passage facilities.

Turner will always take feedback but he is moving forward as is. It is an appropriate step and it is not turning off and modifying the fish passage facilities at this point.

Ebel appreciates the information. It is difficult to track. He asked why the daily trough of TDG is marching upwards.

Turner believes that is due to the upstream TDG, The Dalles tailwater is following a similar pattern. He does not believe that it is due to the spill at McNary but rather the changes in barometric pressure and temperatures. Would be something that would be seen in a river without anthropogenic sources of TDG.

Ebel said that while it is crossing 105% criteria the difference between the peak and the background is not changing in this scenario. Ebel looked at the depth sensor at Warrendale and he found that it is 5-6 feet below surface.

Trevor Conder. NOAA asked when the language of the ODEQ standard (< 2 feet. 105% TDG) was first written in that rule.

Turner believes it was the early 2000s.

Conder is fine with making modifications that are not in the Fish Passage Plan but he is concerned with modifications that do affect the Fish Passage Plan. He does not agree that the 105% TDG standard applies. He believes work needs to be done offline. He said that at a previous meeting that a Corps representative said that they have always used the 105% standard in Chum emergence. Conder does not believe that this is correct, looking back in the notes, in the 2000s there were multiple spills that put TDG up to 110%. The Corner Collector operation (average start date March 17), when operating 24-hours, put us over 105 – 110% in varying levels of tailwater. These are examples of cases that the Corps knowingly operated over the 105% TDG, while the standard was in the rule. He is not sure why there is a shift to operate to a hard line when there before there it was more of a good to do soft constraint. Applying as a hard constraint is a deviation of past process. NOAA is in limbo and feels there needs to be more discussion and clarification before they agree to the 105% standard is the rule.

Stranz asked if the conversation between NOAA and the Corps should be held after the information is back from ODEQ.

Conder said that would work except forced violations to the Fish Passage Plan are going against the BiOp. He is okay with adjusting reservoir elevations since that is allowed in the FPP, it is at the Corps discretion but forcing changes to the FPP without agreement while waiting for ODEQ to respond is not okay. There should be additional discussions.

Stranz asked if there are currently changes being proposed against the Fish Passage Plan.

Conder does not believe that there are currently any plans but that they have been discussions and requests to make them. He is not ready to modify the sluiceway, attraction spill, or the corner collector operation.

Turner said that he has a different perspective on some of the concerns. He is newer to the group and has a different understanding of the 105%/110% TDG, and what has been tried and in what order. He agrees that further conversations are necessary.

Dave Swank, USFWS, asked Turner about how the Corps is looking at the regulation. He asked if the Corps is saying that the concern is because water around the redd locations at Ives Island is less than two feet deep.

Turner said that he agrees that it is unclear and it is difficult to know where it is applied. He added that it is not just Ives; many locations are at varying depths. Earlier in March when TMT started talking about a lower tailwater elevation with potentially many redds under very low to no water. He read the ODEQ criteria and it sounded like less than two feet of water. He also saw the Warrendale gauge near 105% TDG last week. He was concerned and brought it to TMT, there is no evil plan in the background.

Swank believes that the consultation with ODEQ is necessary. He said that he read over the regulations several times and it is still confusing what they meant. In one way it could be referred to water flowing into a hatchery, streams less than total two feet anywhere. It is unclear. It is important that it is cleared up with ODEQ.

Stranz asked Van Dyke as the representative of Oregon if there is anything that he would like to share on behalf of the State.

Van Dyke said that last meeting he asked the Corps to contact ODEQ. He said that it sounds like that effort is occurring. He says that the dialogue in this meeting is still wrapped around interpretation. Until ODEQ responds there will still be a need for interpretation. He thinks there are some detailed words used in the rule that not everyone is seeing. The one that stands out to him is the point of measurement. He said at this point the federal monitoring of gas levels has a standard of 110% TDG. This level is what the gauges are set for. He will say that the discussion needs to occur between ODEQ. Van Dyke said that the Warrendale gauge is connected to a dock. According to the Appendix A TDG monitoring stations information the gauge is at 10 ft. When the water levels drop there is an issue with it plunging into the sediment or having inefficiencies. He asked Turner if that is occurring and if it has affected the gauge's output.

Turner said that there is no indication of this happening. USGS runs that gauge. They look at the quality and report to The Corps. They have not brought up issues. Turner can reach out and double check to see if there is influence from bottom sediment. Turner said that USGS publishes their data and shares the quality control and assurance of each gauge. Turner can also share the TDG annual report.

Van Dyke asked if there are any planned or unplanned operations at Bonneville or is everything back to normal operation as is written in the Fish Passage Plan.

Baus said they are implementing planned operations. The Corps is reaching out to ODEQ and are making plans to reduce the forebay as a soft constraint. Plan to get back to TMT

after clarification from ODEQ. Baus said that he is not sure what the nature of the question was and is happy to report out when there is more information.

Ebel asked if Van Dyke was referring to the maintenance for erosion around the Bradford Island fish ladder.

Van Dyke said that the fish ladder was one example. He felt that Baus was not willing to share that information at this time so he will not distract further.

Baus said that that information is being shared and available to the public through the FPOM process. Information is available for comment. He said to look at the MOC and they are happy to provide any feedback.

Van Dyke said that he was hoping that there would be a fuller assemblage of what is occurring.

Baus is not ready to talk about the plans in this forum at this time. It is being coordinated through Corps-NWP in FPOM through the MOC process. He encouraged that if there are concerns to go through that process because they are not ready to talk about B-branch repairs at this time at TMT.

Stranz said that if there are additional needs required make request in advance.

Ebel said that he thinks that in the MOC it acknowledges that 24 hour operation could increase TDG. He thinks it can be part of the discussion at FPOM. It can be acknowledged that there are possible atypical flows at Bonneville that can contributing to TDG.

Ben Hausmann shared through chat:

For full context on Bonn TDG management, folks should recall that both B-branch and Cascades Island adult ladders contribute to TDG, especially at low tailwaters. Just a note for consideration when trying to interpret causation of TDG levels under current river conditions.

Morrill said he appreciates the presentation from Turner. Washington supports what Conder discussed. He appreciates that the Corps reached out to ODEQ. He recognizes that some redds may be affected by TDG but they are 6-10 inches below the gravel. There is some natural stabilization and/or reduction in TDG as it goes deeper. He would like to have more conversations about whether the two foot and 105% TDG should be applied in the unique situation of the Ives area.

Lorz asked if there would be a meeting next week.

Currently there is a meeting scheduled. An update will be given at TMT.

3. **Public Comments:**

   None

4. **Set agenda for next meeting – March 22, 2023**

Today's Attendees:

Agency	TMT Representative(s)
Army Corps of Engineers	Doug Baus (chair), Lisa Wright
Bonneville Power Administration	Tony Norris, Ben Hausmann
Bureau of Reclamation	Joel Fenolio
NOAA Fisheries	Trevor Conder, Kelsey Swieca
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	Jonathan Ebel
Montana	Brian Marotz
Nez Perce Tribe	Jay Hesse
Umatilla Tribe/CRITFC	Tom Lorz
Colville Tribe	Kirk Truscott
Warm Springs Tribe	
Kootenai Tribe	
Spokane Tribe	

Other Attendees (non-TMT members):

Corps – Dan Turner, Elizabeth Holdren

NOAA – Chris Magel

DS Consulting – Emily Stranz (Facilitator), Colby Mills

BPA – Andrea Ausmus (note taker, Contractor with CorSource Technology Group)