

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

May 1, 2019

DRAFT Facilitator's Summary

Facilitator: Emily Stranz; Notes: 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. 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.nwdwc.usace.army.mil/tmt/agendas/2019/>.

Review Meeting Minutes

TMT members approved minutes and facilitator's summaries for April 10 & 17 meetings. More time was needed to review the minutes and summary from the April 24 meeting.

Dworshak Operations

Steve Hall, Corps, provided current hourly data for Dworshak Dam. The reservoir has filled to 1,568.5 feet, or roughly 5 feet below flood control elevation. The project has seen decent inflows, and is continuing with full powerhouse discharge of 9.8 kcfs. The inflow forecast shows spring flows have been dropping due to cool temperatures and will start rising again next week, peaking at about 20 kcfs. Clearwater River flows at Orofino are dropping, and expected to get down to 16 kcfs in the next couple days, with a minor rise heading into next week.

Steve walked the group through two operational scenarios (available on the TMT website), looking at 2003, when temperatures stayed cool longer with late-May/June snowmelt, and 2013 when snowpack started melting sooner in May. These years should be representative of the water supply forecasts for May, as currently there is 1.5 million acre feet of water left in the basin and close to average snowpack.

The current plan is to maintain full powerhouse (~9.8 kcfs) through May 8, then drop down to 2 small units (~4.8 kcfs) on May 9. On May 13, outflow will drop down to 1 small unit (~2.4 kcfs), through May 16. On May 17, the project will increase back up to two units, then will reach full powerhouse on May 25 and hold until an appropriate level to fill. Summer draft will start around July 5. A snow flight is scheduled for the first week of June to check on the remaining snow pack. Salmon managers felt comfortable with this as an appropriate plan for managing the water and appreciated the seasonal perspective that Steve provided.

Steve clarified that unit 3 is out from May 9 - 24 for performance testing required as part of last year's unit 3 overhaul. This was postponed from last year due to potential harmful impacts to fish from reducing powerhouse capacity at that time. There is also a shorter unit 2 outage scheduled for May 13 - 17, but could potentially only last a couple of days.

FOP Spring Spill

Dan Turner, Corps, reported that Snake River flows generally came down over the last week, and projects are now spilling at the spill caps and performance standard. He noted that TDG looks good, with 5 of the 8 projects right at 120%, two projects at 119% and one project at 121%, which is better than the Corps was expecting in terms of managing TDG. They're generally seeing TDG levels peak in the afternoon, which is not uncommon for the .5% variability in four of the gauges, and could be a result of temperature changes or algae growth.

Last Thursday at The Dalles, the Corps changed their methodology to set the spill cap and is now using a percentage of the total project outflow, which the tracking table has been updated to reflect. From the Corps' perspective, things are working well, and have been able to hit 120% TDG some days. This operation is something the Corps wants to continue evaluating as they collect more data on this approach. Since setting the percentage spill cap last week at The Dalles, the spill cap has ranged from 44 - 48% of total project outflow,

equating to a spill rate that ranged from 99 - 146 kcfs on an hourly basis, averaging 124 kcfs. Dan noted that The Dalles tailrace TDG is heavily influenced by upstream TDG.

Salmon managers were impressed and acknowledged the efforts put forth from the Corps. They recognized TDG levels are hitting 120%, and also expressed interest in exploring other options and operational tweaks to potentially get to a spill level of 135 kcfs at The Dalles that was the estimated spill cap modeled during Flex Spill negotiations. Julie Ammann, Corps, noted that the spill caps at John Day have been higher than what was estimated and modeled, so there is an opportunity to reduce spill there to the modeled level which would allow spill to be increased at The Dalles.

To answer a question from the last meeting, Dan reported that the gauge location at The Dalles changed in 1996, and was moved 2.8 miles downstream from the dam, in the same spot as the USGS discharge gauge.

Flexible Spill Implementation

Tony Norris, BPA, clarified for the group that dips in the spill flow for Lower Monumental on April 24 - 28 that are outside of the flex spill hours were a result of reduced spill for the fish transport barge as it transits across the tailrace. TMT members noted that the website and graphics have been very helpful in walking others through the data and it is often used outside of the TMT forum.

Operations Review

Reservoirs: Joel Fenolio, BOR, reported on Bureau of Reclamation projects:

- **Hungry Horse:** increased releases at the end of last week up to 4,500 cfs to transition into the May refill period, current 3,531.8 feet forebay elevation; the water supply forecast is around 90% of average.
- **Grand Coulee:** releasing 118 – 120 kcfs, with a midnight elevation of 1,272.3 feet.

The final number for Upper Snake River flow augmentation this year is 487,000 kaf; augmentation will start in June.

Lisa Wright, Corps, reported on Corps of Engineers projects:

- **Libby:** midnight elevation was 2,409.2 feet, with average inflows of 9 kcfs and outflows of 9 kcfs;
- **Albeni Falls:** midnight elevation was 2,055.8 feet, with average inflows of 47.4 kcfs and outflows of 45.1 kcfs;
- **Dworshak:** midnight elevation was 1,568.6 feet, with average inflows of 10.8 kcfs and outflows of 9.8 kcfs;
- **Lower Granite:** average outflows were 122.4 kcfs;
- **McNary:** average outflows were 268.2 kcfs; and
- **Bonneville:** average outflows were 280.1 kcfs.

Water Quality: Dan had nothing further to report.

Fish: Paul Wagner, NOAA, reported that adult Spring Chinook are finally starting to rally at Bonneville at 4,705, although it's only 9% of the 10-year average. It's still early in the season for jack Chinook, with 55 passing. Paul noted this year the river is very turbid which could explain the slow start. Steelhead passage is at 50% of 10-year average. At Lower Granite Dam, counts so far are: 10 Spring Chinook, or less than 1% of the 10-year average; 2,782 steelhead, or 35% of the 10-year average; and 1,103 unclipped steelhead, or 34% of the 10-year average to date.

Juveniles are remarkably active so far throughout the system, most likely from the turbidity and high flows. Yearling Chinook indices are showing good numbers even after the tributary traps were shut down due to the high flow. Lower Granite passage index has exceeded 100,000 for Chinook and 270,000 for steelhead, and 550,000

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steelhead are estimated to have passed Little Goose on April 24. Lamprey juveniles have seen substantial passage at Lower Granite, Lower Monumental and Bonneville.

Dave Swank, USFWS, noted an event on April 24 at Lower Monumental when the number of fish in the raceways exceeded capacity for the collection channel and fish had to be dumped out of the raceway. Charles Morrill, WA, noted that this was not a common event, although Salmon Managers expressed concern about fish dying in the collection process.

Power System

Tony noted that wind has died down with the current high-pressure ridge, and regional loads are expected to continue to drop until temperatures rise.

The next TMT meeting will be a call on May 8, 2019 at 9:00 AM.

This summary is respectfully submitted by the DS Consulting Facilitation Team. Suggested edits are welcome, and can be sent to Colby at colby@dsconsult.co.

Columbia River Regional Forum
Technical Management Team OFFICIAL MINUTES
May 1, 2019
Minutes: Melissa Haskin, FLUX Resources

Today's TMT meeting was chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. See the end of these minutes for a list of today's attendees.

1. Review of Minutes and Summaries

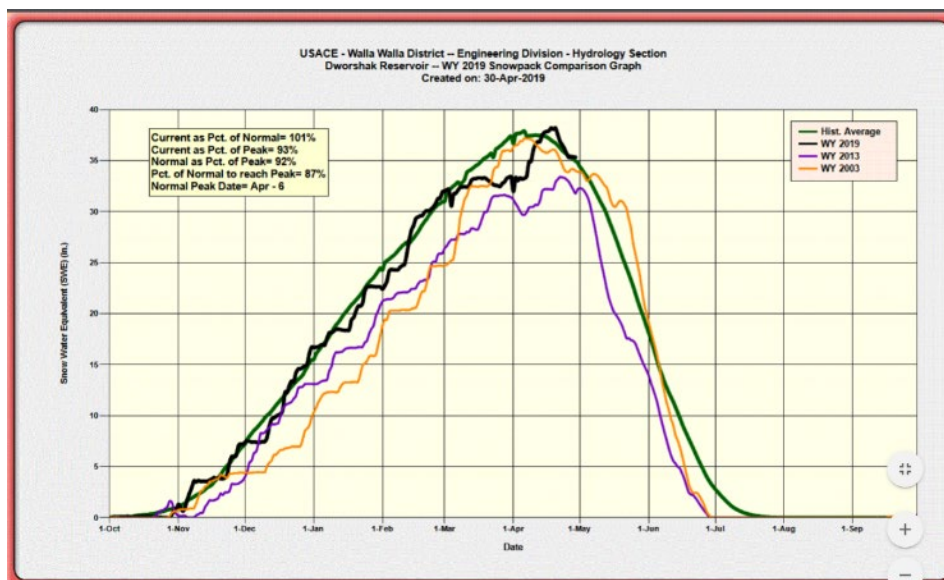
The minutes and summary for the 4/10 and 4/17 TMT meetings were approved. The 4/24 minutes and summary were just posted yesterday and will be on the agenda for finalization at the next in-person meeting on May 15.

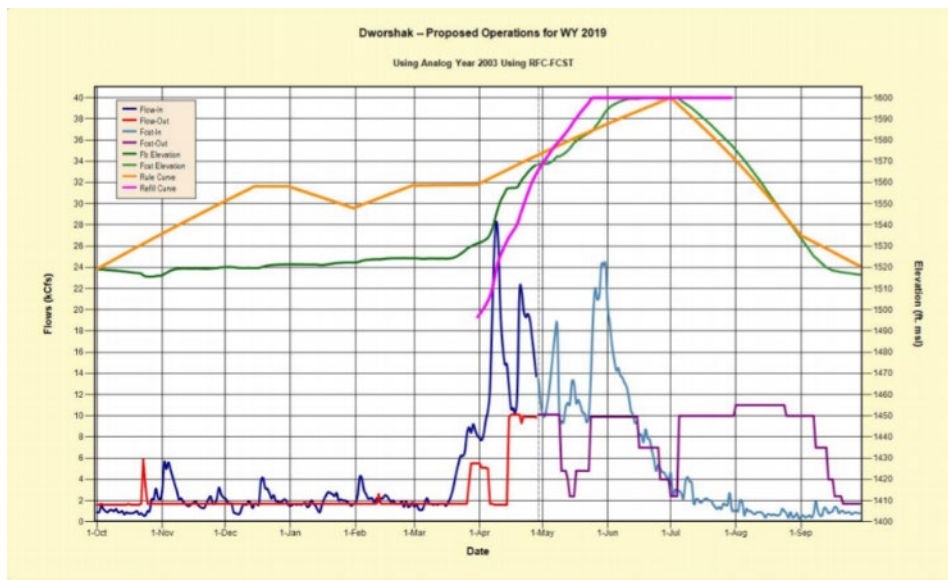
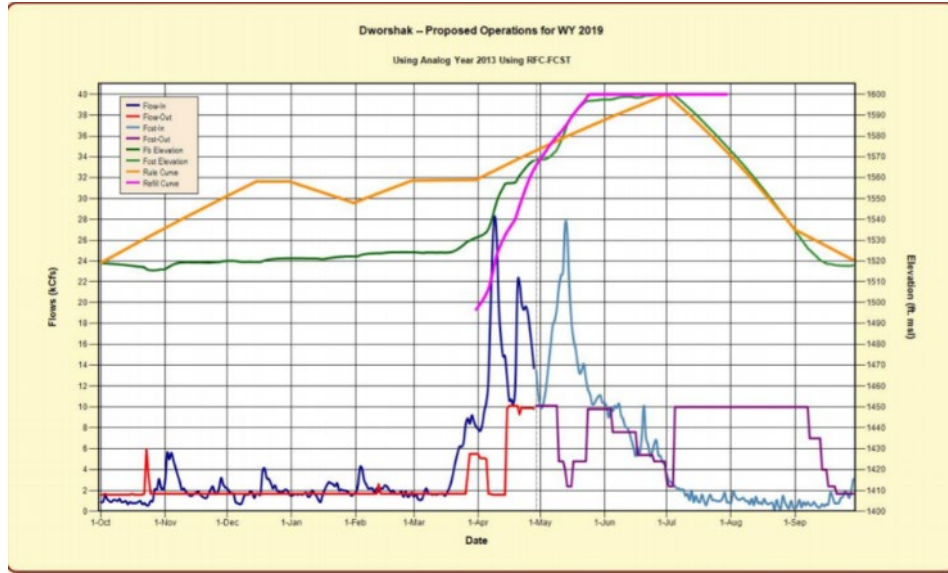
2. Dworshak Operations – *Steve Hall, Corps*

Steve Hall, Corps, reported on operations at Dworshak Dam. The project's midnight elevation was 1,568.5 ft., which is about 5 feet below the flood control elevation (1,573.8). Discharge is currently 9.8 kcfs (full powerhouse).

The RFC forecast shows Dworshak inflows dropping and then beginning to rise again next week and peaking at 20 kcfs. At Clearwater above Orofino, flows are dropping. They should be around 16 kcfs by the end of the week and a minor rise next week.

Hall showed a graph of current snowpack and models for upcoming operations (*see figures below*). The most representative runoff years right now are 2013 and 2003. The official May forecast will come out later this week but these models are the most representative for now.





Hall said there is about 1.5 MAF left in the basin, currently. The model with 2013 data shows a spike up to 28 kcf/s in mid-May, which would be representative of an early runoff year. In this scenario, the reservoir would be nearly full towards the end of May and outflows would have to be reduced through June. The 2003 model shows an increase in inflows to 18 kcf/s next week and then a cooler mid-May with runoff mainly occurring in late-May to early June.

The Corps is proposing to maintain full powerhouse until May 9, when an outage of Unit 3 is scheduled. At that point, project outflow will drop down to two small units, about 4.8 kcf/s. The next decrease will be on May 13 when Unit 2 goes out of service and Dworshak drops down to one unit, 2.4 kcf/s, through May 16. When Unit 2 returns to service on May 17 (or earlier), flow will be increased to two units (4.8 kcf/s). Then, when Unit 3 returns to service on May 25, outflows will be increased back up to full powerhouse of 9.8 kcf/s.

The Corps has a snow flight scheduled for the beginning of June.

Paul Wagner, NOAA, asked what the outage for Unit 3 at Dworshak Dam was for. The answer is that last year Unit 3 was returned to service after a major overhaul. As a requirement of the contract, there must be performance testing. Since that was not completed last season, it was scheduled for May 9-24 this year.

3. FOP Spring Spill - Dan Turner, Corps and Tony Norris, BPA

Dan Turner reported on spring spill. Flows on the Snake River dropped last week so the projects are spilling at spill cap and performance standard and are no longer in involuntary spill. Five of the 8 projects are hitting the 120% TDG target. One project is at 121% TDG and 2 projects are at 119%.

Dan has noticed that TDG tends to rise in the afternoon by about 0.5%. He has a few theories as to what is causing this (e.g., algae and temperatures) but at this point it's still uncertain.

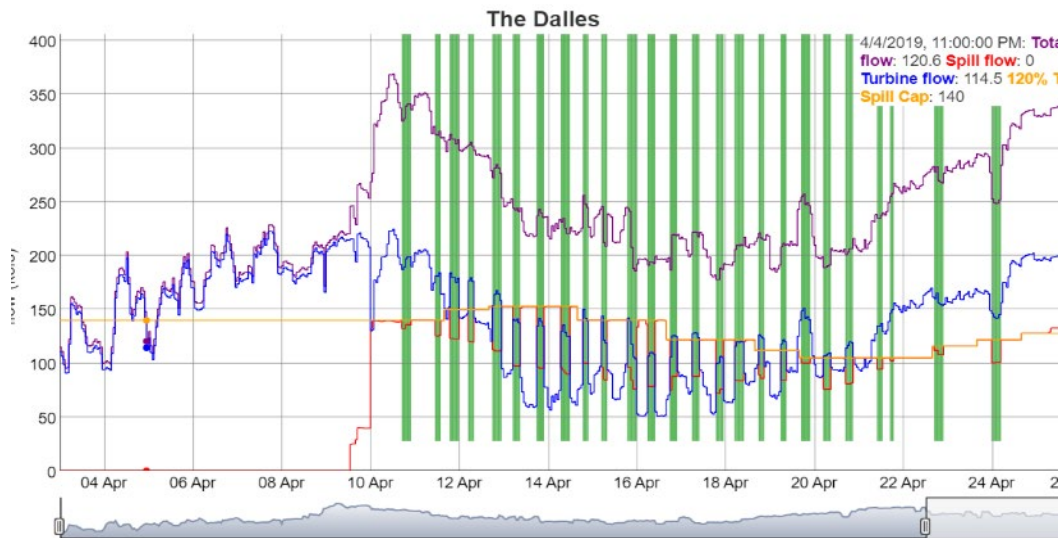
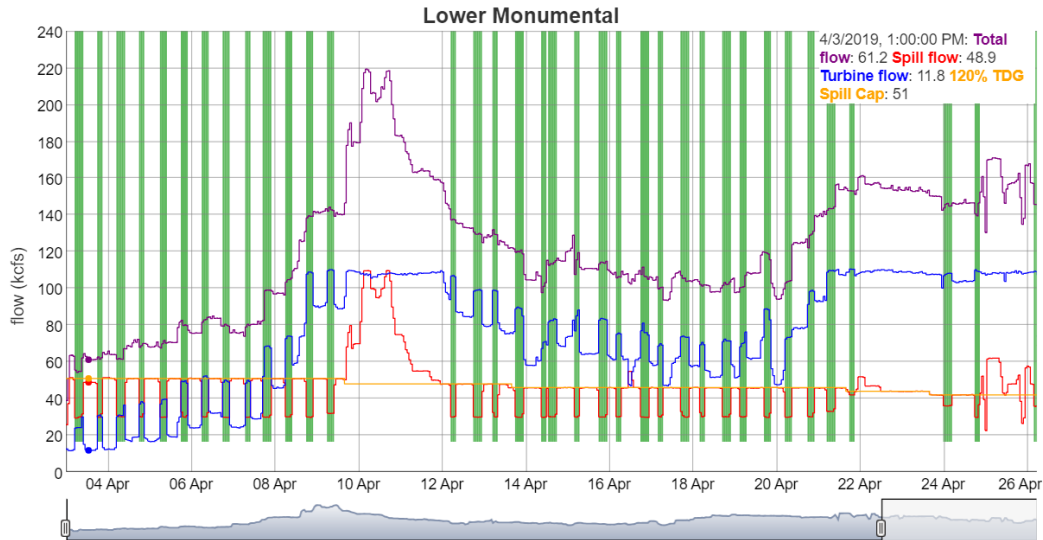
At last week's TMT, the Corps coordinated to implement a new methodology for calculating spill caps at The Dalles to meet but not exceed 120% TDG. The methodology was implemented beginning Thursday, March 25, at 1600. In the operation, spill caps at The Dalles are set as a percentage of total project outflow.

The new methodology has produced excellent results and seems to be a more effective way to set spill caps at The Dalles to meet the gas cap. However, there is still less than a week of data. The Corps would like to continue the operation and collect more information.

The hourly data from The Dalles shows calm weather from Monday-Tuesday of this week. Forebay TDG increased so spill caps were reduced. This shows the example of how forebay TDG affects tailwater TDG.

Last week, Paul Wagner, NOAA, asked why The Dalles tailrace gauge was moved after 2011. Dan looked into it and found that the gauge was moved to its current location in 1996. The previous location was named TDTO and was on the OR side but closer to the dam. When the gauge was moved it was moved to same site as the USGS discharge gauge. Dan said he could not find a rationale. However, some TMT members commented that 1996 was the high flow year that resulted in flooding that could have possibly washed out the gauge.

Tony Norris, BPA, reported on flex spill for BPA. He noted that dips in spill at Lower Monumental outside of flex hours were due to fish barge transit across the tailrace.



Jay Hesse, Nez Perce, commented that the spill caps at The Dalles are below the 135 kcfs level that previously estimated and modeled for fish benefits during negotiations for the Spill Agreement. He asked the Corps to think about operational tweaks that may increase spill to the previously estimated spill cap of 135 kcfs.

Tony Norris, BPA, replied that the spill caps used in the analyses were estimates based on past operations. This year's operation is different than anything that has been done previously. Actual outcomes should be expected to differ from the estimates.

Julie Ammann, Corps, noted that the spill caps at John Day have been higher than what was estimated and modeled, so there is an opportunity to reduce spill there in order to increase the spill cap at The Dalles.

In regards to the daily and hourly spill reports on the TMT website, Hesse commented that it would be appreciated if the default view could be newest at the top instead of having to “reverse sort” each time the page is loaded. It seems that the first step everyone takes when viewing the page is to sort newest first to look at the current data. Turner agreed that would be a helpful tweak and will look into making that change.

Dave Swank, USFWS, asked why there were no hours of flex spill on March 26-27 at Lower Monumental. Norris replied it was because the project was already at full turbine so there wasn't any room to increase generation.

4. Operations Update

4a. Reservoirs – Joel Fenolio, Reclamation, and Lisa Wright, Corps

Hungry Horse – Hungry Horse is releasing 45,000 cfs and is starting to transition into refill. Current forebay elevation is 3,531.8 ft. The target is 10-feet from full at the end of May to reach the June goal of full. The May water supply forecast will probably come in at about 90% of average.

Grand Coulee – Passing inflow at 118-120 kcfs; midnight elevation 1,272.3 ft. The final flow augmentation number will likely be 487,000 kaf. Flow augmentation should start in June.

Libby – Midnight elevation 2,409.2 ft, yesterday's average inflows were 9 kcfs and outflows were 9 kcfs.

Albeni Falls – Midnight elevation 2,055.8 ft, yesterday's average inflows were 47.4 kcfs and outflows were 45.1 kcfs.

Dworshak Dam – Midnight elevation 1,568.6 ft., yesterday's average inflows were 10.8 kcfs and outflows were 9.8 kcfs.

Lower Granite – Yesterday's average outflows were 122.4 kcfs. The RFC forecast shows flows dropping down to 100 kcfs by the end of the week.

McNary Dam – Yesterday's average outflows were 268.2 kcfs.

Bonneville – Yesterday's average outflows were 280.1 kcfs.

4b. Water Quality

Nothing further to report.

4c. Fish – Paul Wagner, NOAA

Adults: Passage has been disappointing to date with 4,705 spring Chinook adult returns to Bonneville, which is only 9% of the 10-year average. Jack Chinook counts are 55 but it is still early in the season. Steelhead returns to Bonneville are 1,712, 50% of the 10-year average.

At Lower Granite, Spring Chinook returns are 10. This is well below the 10-year average. Steelhead at Lower Granite were 2,782, which is 35% of the 10-year average. Unclipped steelhead counts are 1,103, or 34% of the 10-year average.

Juveniles: Juveniles are on the move and very active thus far. Some tributary traps were taken out due to high flows but some have been started again recently.

At Lower Granite yearling Chinook exceeded the 100,000 passage index last week. Numbers were similar down the river including John Day, Bonneville, and Lower Monumental, among others. Steelhead index numbers have been tremendous at most projects.

Due to the high passage numbers, capacity was exceeded in the transport raceways at Lower Monumental and fish were bypassed back into the river. It was an uncommon event that tends to occur once every 3-4 years, reported Paul.

Charles Morrill, WA, showed FPC passage data on smolts that indicate there was an early spike in the numbers but now things are right where they would be expected to be based on historical data. DART shows steelhead above normal for this time of year at Lower Granite.

John Day has seen its peak of lamprey juveniles but things are still strong at Bonneville. DART shows lamprey early and substantial thus far this season.

4d. Power - Tony Norris, BPA

Wind is low due to a high pressure ridge but otherwise regional loads are dropping as they generally do in spring.

5. Next TMT

The next meeting will be a conference call on May 8 at 9 a.m. Call and webinar information is available on the TMT website.

6. Today's Attendees:

Agency	TMT Representative
Army Corps of Engineers	Doug Baus (Chair), Julie Ammann, Lisa Wright
Bonneville Power Administration	Tony Norris, Scott Bettin
Bureau of Reclamation	Joel Fenolio
NOAA Fisheries	Paul Wagner, Claire McGrath
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	Russ Kiefer
Montana	Jim Litchfield

Agency	TMT Representative
Nez Perce Tribe	Jay Hesse
Umatilla Tribe/CRITFC	Tom Lorz
Colville Tribe	N/A
Warm Springs Tribe	N/A
Kootenai Tribe	N/A
Spokane Tribe	N/A

Other Attendees (non-TMT members):

Corps – Dan Turner, Steve Hall, Aaron Marshall, Alexis Mills, Catherine Dudgeon, Alfredo Rodriguez, Michelle Yuen, Laura Hamilton
DS Consulting – Emily Stranz (Facilitator), Colby Mills
FLUX Resources – Melissa Haskin (Note taker)
Public Power Council – Shane Scott
Clearing Up – K.C. Mehaffey
Columbia Basin Bulletin – Mike O’Bryant
Public – Charles Pace