

# COLUMBIA RIVER REGIONAL FORUM

## TECHNICAL MANAGEMENT TEAM

May 26, 2010

### FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

The following notes are a summary of issues that are intended to 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.

#### **Review of Meeting Minutes for May 12, 17 & 19, 2010**

Steve Hall, COE, provided edits to DS Consulting clarifying language in the Dworshak section on page 3 of the 5/12 facilitator’s summary. The group had no other changes to these or the May 17<sup>th</sup> or 19<sup>th</sup> notes. All three sets are now considered final as are the official meeting minutes from all three dates.

#### **Libby Operations**

Joel Fenolio and Jeremy Giovando, COE, directed TMT to link 3.b. posted as a link to the agenda. The graph details storage at Libby dam through yesterday 5/25. The 260 KAF target has been met and will be maintained until next week when release will begin and is assumed to reach zero by the end of June. Jim Litchfield, MT, stated that Montana’s concern is for Libby operations following the sturgeon pulse; specifically, to make sure there is enough volume to do a gradual ramp down. Litchfield said that what was shown in the graph posted to the agenda did not look too bad from Montana’s perspective.

Steve Barton, COE, presented TMT with new information that was brought up late in the day on 5/25 at a Columbia River Treaty meeting: BC Hydro has indicated an interest in keeping Kootenai Lake fuller into July and releasing water out of Arrow. Barton said that he wanted to share this with TMT, so he could be aware of their position on this option, if the opportunity becomes available. Tony Norris, BPA, stated the desire for clear communication around this option. Dave Wills, USFWS, said that this might be a good opportunity to explore this option, and Litchfield concurred with Wills and Norris. Barton clarified that so far, Canadian representatives had not stated a preference for when to make the releases out of Libby in August and encouraged the Salmon Managers to think about the best operations for Libby releases. Barton acknowledged that offline coordination amongst the Action Agencies would need to occur between now and discussion of this option at next week’s TMT meeting and offered to answer any questions from the Salmon Managers offline over the next couple of days as well. Litchfield again stated that Montana’s concern is for a gradual ramp down in flows; Barton said that so far it seemed as though the timing assumed in the models was acceptable to Montana and Litchfield agreed.

**Action/Next Steps:** The COE will run some models for this option as soon as possible and updated graphs for Libby Operations will be posted to the web for TMT to review prior to the 6/2 TMT meeting.

The group then turned their attention to SOR FWS #2010-01, regarding Sturgeon Pulse operations at Libby dam. At the last TMT meeting, Dave Wills, USFWS, provided a brief outline of the SOR and asked that TMT review the material and bring any questions/concerns with them to today's meeting. Jason Flory, USFWS, said that based on the latest data, it is likely the operation would begin the second week of June as river temperatures need to rise some before the SOR can be implemented. TMT members asked clarifying questions regarding operational triggers, flows and scheduled repairs at the dam. Paul Wagner asked Flory if the operation would proceed if not all of the conditions listed in the SOR were satisfied in the next couple of weeks; Flory said no, but the sturgeon will start spawning regardless. Steve Barton, COE, noted that there is a relationship between the Sturgeon Pulse start date and its effect on how and when the stored 260 KAF is released. TMT members were asked for their thoughts on the operational triggers as laid out in the SOR. An informal poll was taken:

- MT- Concerned about descending limb as described in SOR, wants reasonable ramp down from the pulse. Is concerned with effects of operation on aquatic life below the reservoir as well as storing as much water as possible and am not authorized to weigh in on the SOR at this point.
- ID- Supports the SOR.
- WA- Supports the SOR
- NOAA- Supports the SOR
- USFWS- Supports the SOR
- Umatilla Tribe- No objection
- BOR- No objection
- BPA- OK
- COE- Supports the SOR.
- Colville Tribe- No objection

**Action/Next Steps:** This item will be on the agenda for the TMT meeting on 6/2; TMT will discuss updated data and assumptions for the start date for the Sturgeon operation.

### **Dworshak Operations**

Steve Barton, COE, reported on recent operations for May 19-21<sup>st</sup>; the dam released full powerhouse flows as described in the SOR. He reported the peak flow out of Lower Granite was 106 kcfs on May 20<sup>th</sup>, averaging 100 kcfs while coinciding with the natural flow peak. Paul Wagner, NOAA, reported that an increase in passage was observed at all Snake River projects and was in fact, quite substantial in some places. TMT reviewed passage data posted on the Fish Passage Center site; it appeared fish were indeed in the reservoir as hoped and these assisting flows, which coincided with the natural peak, were just the queue they needed to migrate out of the area. Barton and Wagner concurred that it was a well-executed and successful SOR. Steve Hall, COE, shared that strictly based on the latest water supply information Dworshak may barely fill, with only about 6 KAF

of surplus. Filling will of course depend on actual inflow which is likely to be different than the current water supply value.

**Action/Next Steps:** The COE will share updated modeling and the June forecast at the 6/2 TMT meeting.

### **Priest Rapids Flow Objectives**

Paul Wagner NOAA, shared that this issue was discussed at FPAC on 5/25. He reported that passage of wild Sockeye at Rock Island is way up and Steelhead numbers were quite good as well. Based on data from the Fish Passage Center site, the FPAC consensus is to hold the current objective of 125-135 kcfs though next Wednesday 6/2. Fish movement, forecasting etc will be revisited at that time to determine next steps. Wagner also reported that moving to a McNary flow objective (as suggested by Tony Norris, BPA) was also discussed at FPAC and the early sentiment of the group did not favor this operational change at this time. Norris noted that operating to a weekly average discharge as opposed to a daily flow objective is preferable.

**Action/Next Steps:** Priest Rapids will be operated flow objective of 125-135; the Action Agencies will manage the project in a way that provides the best chance at meeting Grand Coulee refill while staying in that flow range for the weekly average. This issue will be discussed at the TMT meeting on 6/2.

### **Treaty Fishing Summary**

Tom Lorz, CRITFC, reported that the recent Treaty Fishing season lasted two weeks. Two SORs were issued for that time period during which Bonneville, John Day and The Dalles were all held to a 1.5' band. He clarified that operations were actually closer to a 1' band, which historically has been more desirable. No issues were reported.

**Action/Next Steps:** Lorz will report final catch numbers at the 6/2 TMT meeting.

### **Hanford Reach Summary**

Russell Langshaw, Grant County PUD, directed TMT to a link posted to the agenda. He updated the group on the past two weeks of operations: the daily delta constraints were 30-60 kcfs, averaging 40 kcfs. Priest Rapids mean daily delta was 129.41 with a minimum of 112.35 and a maximum of 150.5. The mean daily minimums ranged from 105.9-138.2 and averaged 114.4. The maximum was 144.5. The actual daily delta was 30.1 ranging from 14.5-39.3. Langshaw noted that the increase in flows were not as large as expected. He reported that current temperature units are at 220 and that protection flows will end when 400 temperature units are reached. As temperature units accumulate at a rate of approximately 11 per day, protection is expected to continue for a couple more weeks.

**Action/Next Steps:** Langshaw will update TMT at the 6/9 meeting.

### **Operations Review**

**Reservoirs:** Grand Coulee was at elevation 1264.4' and meeting Priest Rapids objectives of 125-135 kcfs. Hungry Horse was at 3537.97', with 4 kcfs outflows and current inflows of around 7 kcfs. Libby was at 2418.33' with inflows of 17.6 and outflows of 14.5 kcfs. Albeni Falls was at 2058.79' with inflows of 34.7 kcfs, and outflows of 30.1 kcfs. Dworshak had inflows of 8.4 kcfs and outflows of 1.3 kcfs. Priest Rapids had 141.4 kcfs outflows (averaging 131.8), Lower Granite had 73.3 kcfs outflows and McNary had 219 kcfs outflows.

Fish: TMT looked at data posted to the Fish Passage Center site. Cindy LeFleur, WDFW, reported on Adult passage: the cumulative Spring Chinook count at Bonneville is 232,000 with daily passage below 1,000. She noted that the forecast calls for a strong run at over 300,000. She noted that Jacks are on the low side at 11,000. Paul Wagner, NOAA, reported that it was determined that the variable operation of the spillway weir at Little Goose appears to be an impediment to passage. The day the weir was taken out of service (to change from high to low crest position) 10,000 fish passed. Adult counts then fell when the weir was re-opened. It was then turned back off and another 10,000 fish passed. The weir is currently shut off and spill is in a uniform pattern. It is scheduled to be turn back on Thursday afternoon 5/27, which should take 1-2 hours. The River Forecasting Center is predicting flows of 90 kcfs which will hopefully be enough to not delay adults. Russ Kiefer, ID, added that this issue of passage delay between Little Goose and Lower Monumental needs to be resolved; an operation needs to be determined that is good for both adults and juveniles. The Salmon Managers will try to avoid making recommendations to the COE for more than one operational change per week.

**Action/Next Steps:** The spill way weir operation at Little Goose will be revisited early next week and Wagner will report back to TMT on 6/2.

Power: Tony Norris, BPA, reminded TMT of a recent transmission limitation. He reported that the limitations were resolved.

Water Quality: Scott English, COE, reported that all gauges are working well and that there were no exceedances this week.

**The next TMT meeting will be: a face to face meeting on 6/2 at 9:00 am at the COE.**

Agenda items will include:

- Notes Review
- Libby Operations Update
- Dworshak Operations Update
- Priest Rapids Update
- Operations Review

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

**May 26, 2010**

Notes: Pat Vivian

**1. Introduction**

Today's TMT meeting, held at Spring Creek National Fish Hatchery, was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the USFWS, COE, BPA, BOR, CRITFC, Montana, Washington, Idaho, the Colville tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Anyone with questions or comments about this summary should provide them to the TMT chair or bring them to the next meeting.

**2. Review Meeting Minutes for May 12, 17 and 19**

May 12 facilitator's notes: Halton reported that Steve Hall (COE) has edits:

- *Page 3, second paragraph* – "...the cost of running outflows at full powerhouse (about 10 kcfs) for three days is that the pool would end up 3 feet lower than it otherwise would have" replaces "...would draft 3 feet."
- *Page 3, third paragraph, middle* – "The COE cautioned that the pool elevation at Brownlee has been decreasing" replaces "...releases out of Brownlee were decreasing."

With these changes, the May 12 facilitator's notes will be considered final. There were no edits today to the facilitator's notes for May 17 and 19, or to the official minutes for May 12, 17 and 19. They are all considered final.

**3. Libby Spring Operations – Storage Accounting and SOR-FWS #2010-1**

Joel Fenolio and Jeremy Giovando (COE Seattle) discussed SOR-FWS #2010-1 with TMT. The SOR has been posted on the TMT web page for review since last week's meeting. It describes Libby operations during the ascending limb, peak, and descending limb of the 2010 sturgeon pulse. The descending limb was a focal point of concern in TMT's discussion today.

As of yesterday, the 260 kaf of the Phase 2 Libby operation was stored in the reservoir, Giovando reported. Attachment 3b to today's agenda depicts storage volumes in Libby reservoir over time under the deviation request compared to what it would have been under the VARQ operation. The reservoir is headed toward 2,419 feet elevation, while under the VARQ operation the reservoir would only be at elevation 2,411 feet, Fenolio said. The COE will maintain the 260k storage until either the sturgeon pulse begins or starting next week, with a commitment to flow neutrality by the end of June.

Inflows to the project have dropped off recently, probably due to a combination of cooler temperatures and less snowpack than usual. When temperatures finally rise, inflows will probably rise again. The 10-day inflow forecast depicted in attachment 3b is a deterministic forecast. The daily hydrograph used in the graph may be lower than the COE's official inflow forecast. Regardless of inflow traces, the COE is committed to release 260 kaf of storage from the reservoir by the end of June. Refill of Libby reservoir this year looks unlikely, Fenolio said.

Montana is concerned about whether it will be possible to maintain an operation that ramps down gradually after the sturgeon pulse ends, Jim Litchfield (Montana) said. Will there be enough volume for the sturgeon flows and a gradual ramp down, then reservoir refill by the end of June? The sturgeon pulse is triggered by a confluence of environmental conditions including water temperature and spawning behavior that's difficult to predict. Lack of a specific date raises concerns about a steep drop in outflows toward the end of June.

There may be an opportunity with B.C. Hydro to supplement flows at Grand Coulee with releases from Arrow Dam in June, Barton announced. The swap arose as a possibility yesterday and could be mutually beneficial. It has the potential to allow all or part of the 260 kaf release to be pushed into summer without affecting the flow neutrality of Grand Coulee this spring. The same volume would be released at Arrow instead of at Grand Coulee. Barton asked TMT members to start thinking about this possibility. The Action Agencies still need to coordinate their own responses to the swap internally, and it might not even be in the best interest of the Northwest to pursue. It's important to avoid the kind of conversations that arose over the 2008 Libby-Arrow swap, Tony Norris (BPA) recalled. What's needed this time is mutual understanding of prospective benefits, including the timing of releases from Arrow. The COE will develop graphic comparisons of alternatives to aid in the decision-making process for use at next week's meeting.

Jason Flory (USFWS) led a discussion of the sturgeon pulse SOR, attachment 3a to today's agenda. With cool temperatures in the Kootenai forebay all the way to Bonner's Ferry, and a forebay elevation below what's needed to spill 10 kcfs, the sturgeon pulse probably won't start until the second week of June, Greg Hoffman (COE Libby) said. The reservoir is currently at elevation 2,418 feet, creeping upward slowly. The temperature at Bonner's Ferry – an indicator of when the sturgeon pulse should start at 8 degrees C – is 7.5 degrees C today. Paul Wagner (NOAA) asked if there's a date when the sturgeon pulse would start regardless of the triggers. Eventually, river temperatures will rise to a point where sturgeon spawn regardless of reservoir operations, so there's no sense in withholding releases if the bulk of sturgeon spawning is already done, Flory said. If inflows drop below VARQ flows of 14.5 kcfs, the COE would reduce discharges rather than draft the reservoir to meet VARQ, Fenolio said.

Barton asked for people's initial thoughts on the recession limb as depicted in attachment 3b, which reflects the COE's commitment to release all Phase 2 stored water by June 30. The descending limb of the sturgeon operation will probably be steeper than currently projected, Fenolio noted.

The SOR and its associated triggers can be distinguished from disposition of the stored 260 kaf and TMT's outstanding agreement to revisit the end of June deadline for its release, Barton pointed out. If it appears the sturgeon pulse will crowd the end of June target, the COE will probably begin releasing the 260 kaf before the sturgeon pulse begins. With these caveats, TMT members gave the sturgeon recovery team their views of the SOR:

- **Montana** – Undetermined variables, mainly lack of a start date and the resulting lack of a clearly defined descending limb, make it impossible for Montana to either support or oppose the SOR until more definite information is available. The problem is not the sturgeon pulse itself, which has followed the same triggers for years, but commitment to release the stored 260 kaf by June 30, which could create ramp-down problems if the sturgeon pulse starts late.
- **Idaho** – Supports the SOR.
- **Washington** – Supports the SOR.
- **BOR** – No objection.
- **BPA** – No objection.
- **COE** – Supports the SOR.
- **CRITFC (for Umatilla Tribe)** – No objection.
- **Colville Tribe** – No objection.

TMT will revisit this issue at its next meeting June 2, with more detailed information from the COE on both the sturgeon operation and the Canadian proposal for a Libby-Arrow swap.

#### ***4. Dworshak Operations***

From May 19-21, Barton reported, Dworshak Dam released full powerhouse flows, with a peak discharge of 106 kcfs from Lower Granite on May 20, as coordinated via SOR 2010-2 at TMT last week. The resulting juvenile steelhead index counts of 120,000 at Lower Granite on May 21 and 180,000 at Little Goose, followed by another 100,000 juvenile steelhead on May 21 confirm that the fish were in the reservoir as presumed, waiting for a cue to migrate. There could be more fish to come this week, with flows expected to be 90 kcfs at

Lower Granite. There was general consensus that SOR 2010-2 was carried out well and benefited fish.

Russ Kiefer (Idaho) explained that, with CRFM improvements on the Columbia, actual smolt passage numbers are higher now than index counts. Addition of surface weirs in recent years has increased the effectiveness of spill, which produces higher passage numbers. Index counts therefore give a good indication of run timing but not actual abundance. Wagner agreed the estimates of actual passage involve a lot of uncertainty.

### **5. Priest Rapids Flow Objectives**

Yesterday FPAC discussed flow objectives for Priest Rapids Dam and wrestled with a lack of information regarding inflows, Wagner reported. Wild juvenile steelhead and sockeye passage numbers at Rock Island Dam are way up. Efforts are underway in Canada to improve the natural production of sockeye. In light of these high passage numbers, FPAC members agreed to stick with their current recommendation of 125-135 kcfs flows at Priest Rapids, at least until TMT meets again on June 2. A recent STP inflow trace suggests that maintaining flows of 125 kcfs is possible while still refilling Grand Coulee this year.

Tony Norris (BPA) recalled his suggestion at the May 19 TMT meeting to switch the focus from Priest Rapids to McNary discharges. If the focus remains on Priest Rapids, an objective of 130 kcfs might be a little high. Shifting down to 125 kcfs would work, Wagner said, but the Salmon Managers didn't want flows to go below 125 kcfs, given that passage is still occurring at mid Columbia projects.

TMT members informally exchanged their views of the Priest Rapids operation:

**BOR** – There's a tradeoff involved in providing 125-130 kcfs next week at Priest Rapids. It could either mean a more precipitous drop in flows at Priest Rapids and McNary later, or not refilling Grand Coulee.

**BPA** – In terms of a planning horizon for the Priest Rapids flow objective, a Monday-Sunday weekly average is more sustainable than a daily average. A decision not to refill Grand Coulee as a result would involve BiOp and legal policy issues. Switching to a McNary objective now could give the Action Agencies greater ability to manage Grand Coulee refill and take advantage of precipitation events – relevant because precipitation is expected to rise over the next 10 days. Depending on the shape of runoff, expects reductions of 10-20 kcfs in McNary flows the following week as the Action Agencies transition to refill.

**NOAA** – Wants feedback from the Action Agencies on relative risks and the effects on Grand Coulee operations of the Salmon Managers' request for flows of 125-135 kcfs at Priest Rapids. Recognizes that Grand Coulee might not refill this year as a result –3 feet less volume in the reservoir is not a precipitous drop.

**CRITFC/Umatilla Tribe** – Supports NOAA's position.

**COE** – The COE will evaluate the risks involved to see if they trigger policy issues that need to be discussed.

**Colville Tribe** – Fish passage numbers are increasing, so it's a good idea to keep flows at 125-135 kcfs for now. Hopefully, the oncoming precipitation will help. If Grand Coulee misses its refill elevation, that would be all right down to 1,288 feet. End of June elevations below 1,280 feet usually mean hitting the reservoir too hard later in order to provide summer flows.

## ***6. Treaty Fishing Summary***

Two SORS for the fisheries requested minimum fluctuations of 1.5 feet at the Bonneville, John Day and The Dalles pools, with no reports of fishing problems, Tom Lorz reported. Fluctuation ranges were closer to a foot as historically requested, which was appreciated. CRITFC is summarizing total catch numbers for the 2010 fishing season and will provide final counts at the June 2 TMT meeting.

## ***7. Hanford Reach Summary***

Russell Langshaw (Grant PUD) summarized the Priest Rapids Dam operation over the past 2 weeks. Daily deltas were 30-60 kcfs, and mean daily discharges were 129.4 kcfs. Minimum flows were 112.3 kcfs and maximums were 150.5 kcfs. Mean daily minimums averaged 114.4 kcfs, ranging from 105.9-138.2 kcfs. Daily maximums averaged 144.5 kcfs, ranging from 122.6-159.1 kcfs. Actual daily deltas averaged 30.1 kcfs, ranging from 14.5-39.3 kcfs. The operation is 220 temperature units from the end of emergence. That means probably another couple weeks of protection flows. Langshaw will give another update at the June 9 TMT meeting.

## ***8. Operations Review***

**a. Reservoirs.** Grand Coulee is at 1,264.4 feet elevation, discharging to meet the Priest Rapids flow objective of 130 kcfs. Coulee inflows next week are projected to be flat. Hungry Horse is at elevation 3,537.07 feet, 22 feet from full, with outflows of 4 kcfs which will continue until the weather warms. Inflows peaked at 20 kcfs a few days ago, then dropped when snowmelt stopped. Inflows are expected to pick up again in the next few days. Libby is in a similar situation, with 17.6 kcfs inflows as compared to a peak inflow of 37.9 kcfs on May 19 before the cold spell hit. Libby is discharging VARQ flows of 14.5 kcfs. Elevation is 2,418.33 feet.

Albeni Falls inflows are 34.7 kcfs, outflows 30.1 kcfs, with a reservoir elevation of 2,058.79 feet. Dworshak inflows are 8.4 kcfs, with 1.3 kcfs

discharges. The powerhouse discharge operation requested in SOR 2010-2 for 3 days coincided with the natural inflow peak. Priest Rapids is releasing 121.4 kcfs today, with an average of 131.8 kcfs for the week ending May 23.

McNary outflows are 219 kcfs. Lower Granite peak discharge was 106 kcfs on May 20; now it's 73.3 kcfs.

**b. Fish. Adults:** At Bonneville, the cumulative counts are 232,000 spring Chinook adults, with daily counts dropping below 1,000 last week and rising again this week, Cindy LeFleur (Washington) reported. The predicted spring Chinook run size is 315,000 at the river mouth, 67% of the preseason forecast of 470,000. Jack counts are at 11,000 so far this year, compared to 80,000 last year, which was phenomenally high.

A disparity of some 20,000 adults between Lower Monumental and Little Goose for a few days suggested a problem, Kiefer and Wagner noted. So the Little Goose spillway weir was changed to the low crest position to allow greater volumes to pass over the weir. When it went out of service for a day, 10,000 fish passed Little Goose. This problem seems to arise when flows over the weir are less than 70 kcfs. It's a tradeoff between juvenile and adult passage, with juveniles benefiting from the weir at the expense of adults. The passage index assumes 1:1 but collection efficiencies suggest it's closer to 5:1, or 5 fish passing for every fish detected.

Juveniles: The uptick of yearling Chinook passage occurred on May 18 which is also when flows increased, Wagner reported. The data suggest that 2010 passage is similar to 2007, another low flow year, with a lot of fish passing undetected. Steelhead passage at Lower Granite to date is lower than 2007, which suggests either that the fish have already passed the project or haven't yet arrived. The mystery won't be resolved until passage is over.

Spill patterns over the Little Goose weir that delay adults need to be studied in the search for an operation that doesn't benefit one age group at the expense of another, Kiefer said. On the afternoon of May 20, the COE put the Little Goose surface weir back into operation to boost adult passage, at the Salmon Managers' request, Kiefer said. Work is in progress to develop a spill pattern that aids juvenile migration without delaying adults. Kiefer and Wagner will give an update at the next TMT meeting on plans to use the surface weir at Little Goose over the next few weeks.

Doug Baus (COE) asked whether FPAC likes the process in place for operating the Little Goose weir, or do they envision changes? The process seems to be working well, Kiefer said. There will be more discussion of how to manage the changes from high to low crest position in ways that meet the needs of both juveniles and adults. Charles Morrill (Washington) agreed the process is working well. TMT will revisit this issue at its next meeting June 2.

**Power.** Last week BPA emailed TMT members regarding transmission limitations that were affecting BPA's ability to move generation where it needed to be, Norris reported. Since then, the transmission limitations have been resolved and no further limitations are expected.

**Water Quality.** All gages are working well, and there have been no exceedances over the past week, Scott English (COE) reported.

### **9. Next Meeting**

The next TMT meeting will be June 2 in Portland. The agenda will resemble today's agenda, with updated information and graphs on Libby operations provided by the COE.

<b>Name</b>	<b>Affiliation</b>
Charles Morrill	Washington
Russ Kiefer	Idaho
Paul Wagner	NOAA
John Roache	BOR
Tony Norris	BPA
David Wills	USFWS
Tim Heizenrader	Centaurus
Steve Barton	COE
Doug Baus	COE
Scott English	COE
 <u>Phone:</u>	
Cindy LeFleur	Washington
Tom Lorz	CRITFC
Jim Litchfield	Montana
Bill Rudolph	NW Fish Letter
Shane Scott	PPC
Glen Trager	Shell Energy
Dave Benner	FPC
Russ George	WMC
Karl Kanbergs	COE
Jason Flory	USFWS
Joel Fenolio	COE
Jeremy Giovando	COE Seattle
Greg Hoffman	COE Libby Dam
Greg Lawson	Point Carbon
Rob Allerman	Deutsch Bank
Tom Le	Puget Sound Energy
John Hart	EWEB
Scott Bettin	BPA
Russell Langshaw	Grant PUD
Steve Barton	COE
Sherry Sears	Colville Tribe

Steve Hall  
Greg Hoffman

COE  
COE