# Bighorn River System Issues Group
# Meeting Summary
# Billings, Montana
# October 9, 2008

## Welcome

Participants were welcomed and introduced themselves. Facilitator, Barb Beck, reviewed the agenda and meeting outcomes, and gave a brief history of the issues group which has been meeting for one and a half years. The Issues Group works on short-term and long-term issues and also has a number of technical studies underway. The work of the group is guided by the following charter statement:

*"The Bighorn River System Issues Group has been formed to identify, explore, and recommend alternative courses of action to local, tribal, state, and federal entities responsible for managing Bighorn River system resources for their consideration as part of long-term management strategies. The challenge is to re-examine the uses and needs of the Bighorn River system to find an appropriate balance of public benefits while recognizing the respective agencies' commitments to authorized project purposes, legal obligations, contemporary needs, and public expectations."*

The last meeting of this group was held in July and focused on climate change. The group also heard about a model for reservoir operations that is being used at Libby and Hungry Horse Dams by the Bureau and the Corp of Engineers. This approach is referred to as VAR-Q. The underlying goal of VAR-Q is to retain more water in the reservoirs to meet demand. There appears to be opportunity for application of this concept to Yellowtail operations.

## Progress Check (Lenny Duberstein)

The new fiscal year makes it appropriate to take stock of where we are with this effort. Three major studies have been initiated and are underway; sedimentation management in the reservoir, adjusting the flood pool elevation, and geomorphology of the Bighorn River. Results are expected soon from two of these efforts. Once the "appraisal level" reports are received, decisions can be made about pursuing certain recommendations further with feasibility level work and NEPA as needed. The group is coming to a mutual understanding of the resource needs (expressed in terms of reservoir levels and/or river flows) of the various agencies. Finally, Reclamation is working on better and more transparent tools to help with operations decision making.

## Power Marketing (Nancy Schied, Western Area Power Administration)

Yellowtail Dam provides power to a large area of the western U.S. and is the largest/most important generator in this system. The Energy Management and Marketing Office of Reservoir Operations performs many functions related to control area and contracting merchant activities including;

- scheduling and delivery of firm electric service energy/capacity,
- operation of generation/reservoirs in the most efficient manner,
- operation of generation resources,
- purchasing and/or sell energy,
- re-balancing reservoir elevations to daily targets,
- monitoring load/resource balance,
- making energy purchases, and
- scheduling resources and making surplus sales.

Performing these management functions is highly complex, real-time, and requires constant communication with power delivery customers.

## Flow-Stage Relationships (Duberstein)

Lenny reported that there is interest in generating power from the afterbay and that this will receive more scrutiny in the next couple of years.

Reclamation is realizing that moss below the dam affects river levels. Flows from the dam are now calculated from the stage of the river below the dam. Soon, gates controlling flow from the afterbay will be able to more accurately measure releases from the afterbay. The elevation in the river depends not only on releases, but also on moss. The water is higher in the river at the same release levels, when there is moss. The moss impacts flows especially during lower flow months, typically from October through December. Lenny has looked at the last ten years and the average shift in flow due to moss is 1.12 feet. This year the drop will be close to 1.5 feet. This has implications for fish habitat availability. What is not known is how much drop in water level of the river is due to moss and how much is due to flow fluctuations. BOR wants to look at release options to protect rearing habitat and reduce the impact of the shift due to moss. Staff gages are being installed to monitor this.

## Re-cap of Resource Needs Identified by Agencies (Duberstein)

Lenny summarized the resource needs of Wyoming Game and Fish (for the reservoir fishery), the National Park Service (for recreation opportunities), the Bureau of Reclamation (for multiple purposes), and Montana Fish, Wildlife and Parks (for fisheries in the reservoir and the river.) Looking at all of the identified needs from the agencies it appears that maintaining the reservoir at 3620 feet or

higher throughout the entire year is desirable. During the non-summer recreation season 3630 feet would be acceptable and from the end of April or May through September, the lake level needs to be at 3640 feet. Montana Fish, Wildlife and Parks has set 3500 cfs as their optimal flow from the dam, 2500 cfs as the target minimum, and 1500 cfs as the absolute minimum. While this is still a work in progress, the needs of all agencies are becoming clear.

## Fall/Winter Operations Forecasting Tool (Gordon Aycock)

Unlike Hungry Horse and Libby Reservoirs, Yellowtail has not had standard storage reservation rule curves. The VAR-Q approach used at these other two reservoirs revised the rule curves to reduce wintertime draw downs, provide better assurance of refill, and reduce probability of significant release reduction during spring refill. Except for years of high runoff potential, not as much of the reservoirs are evacuated.

There are some key differences between Yellowtail and the other reservoirs that need to be factored into a similar approach. These differences include size and capacity of reservoir, upstream reservoirs, irrigation development, modification of the natural hydrograph upstream, size of the drainage basin, range of inflows, and the fact that Yellowtail has an exclusive use flood pool. Application of these rule curves to the operations decisions would depend on runoff forecasts. Gordon applied these rule curves to Yellowtail for the years 1973, 2000, and 2008. Looking at these three years, application of the rule curve worked well. The rule curve serves as a guide to getting to lake elevation targets. The actual situation can be compared to the rule curve and serve as the basis for making adjustments in releases. Gordon concludes that this model can be a useful tool for Yellowtail as long as upstream reservoir operations are factored into the rule curves. This may mean the shape of the curve will need to be adjusted. Participants commented that using the rule curves for decision making would increase comfort levels that decisions were being made on sound rationale rather than political pressure.

Using his spreadsheet, Gordon calculated a fall/winter release of 2535 cfs through April 1, 2009 based on the storage, gain, and planned releases from the two upstream reservoirs. The reservoir will not be drawn down as much over the winter this year, and the fish flows and power generation should remain largely unchanged.

### "What If" Questions from July Meeting (Clayton Jordan)

At the July meeting, participants asked Reclamation to look back at spring 2008. Clayton modeled two questions 1) What if the flows had not been reduced from 1900 to 1500 cfs? And 2) What if the late May rains had not occurred? Clayton found that inflows, upstream releases, and reservoir levels were very similar through May 20 for 2006 and 2008. Based on this he estimates that the

difference in the reservoir from releasing 1500 cfs versus 1900 cfs was 13,500 acre feet. He was unable to draw any meaningful conclusions in response to the second question.

## Updates

Status of Bighorn Lake Fishery: Mark Smith reported an improving trend in the reservoir fishery with record catches for both sauger and walleye. Fishing has been good compared to historical years. They are seeing a lot of young-of-the-year crappies and sauger. The fishery is at a decade high.

Status of Bighorn Lake and River in Montana: Ken Frazer reported that the lake situation in Montana mirrors that in Wyoming with sauger and catfish doing well. FWP will be looking at sauger genetics and may eventually stop planting walleye in the lake. There was a lack of young-of-the-year fish in the river in the fall of 2007. Spring 2008 they saw good numbers of rainbow and brown trout in the two-year and over category. The spawn this year was late and production is unknown. The fish that were caught this fall were smaller, with fewer young-of-the-year. There are lots of larger rainbow in the lower river, but a lack of brown trout. The mark and recapture this fall has been comparable to last fall.

Afterbay Gates: Tom Manni reported that Reclamation is upgrading the gates at the afterbay to more accurately measure flow through the river. Tom expects to be able to do use the new system to control and fluctuate the flow through each individual gate soon, and from this calibrate the system. It will probably be a year before the system is proven. In the meantime, Reclamation will be working with the fisheries biologists to schedule calibration flows.

Technical Studies: Lenny Duberstein reported on the three major studies underway. The sediment management study is being done in cooperation with the Corp of Engineers. Reclamation and the National Park Service are funding this $75K project. The draft report is due October 31. The Joint Use Flood Pool study is also being done in cooperation with the Corp. This $170K study has been funded by Reclamation. The study will look at the issues associated with raising the joint use flood pool from 3640 to 3645 feet. Final reports for both of these studies should be completed by the end of November. The Bighorn River geomorphology study is underway, but lacks the funding to be completed. Reclamation has funded $40K of the $400K need. Select years from the past 40 years of aerial photographs have been assembled and rectified. A number of parties have signed a Memorandum of Understanding to cooperate in this study. Lenny anticipates getting these entities together soon to determine how to proceed. Karen McCreary, representing Senator Enzi, offered to research some funding possibilities. She requested that Lenny forward information about funding needs to her.

Assessment Report: Lenny Duberstein reported that he anticipates beginning work on this in earnest in November incorporating information from the technical studies as it becomes available. Lenny will circulate portions of this report to issue group members as they are drafted. We will discuss this report at the next issues group meeting.

## Wrap-up

Participants liked the shorter meeting (4 hours.) Use of the sound system was a problem, some individuals had a hard time hearing the presentations. It was difficult for those phoning in to hear the presentations and discussion.

The next meeting is tentatively scheduled for Thursday, December 11, in Wyoming. Location TBD. Power customers participating by phone asked for consideration of travel logistics in selecting the meeting location. The agenda will include presentations of results on the two major studies undertaken in cooperation with the Corp and next steps associated with those studies, and discussion on the Assessment Report. The meeting will be postponed if the study results are not available. The issues group meeting adjourned. The Reclamation Fall Operations meeting commenced in the evening.