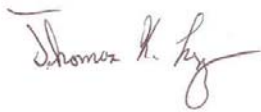


# State, Federal and Tribal Fishery Agencies Joint Technical Staff Memo

*Columbia River Inter-Tribal Fish Commission  
Idaho Department of Fish and Game  
Oregon Department of Fish and Wildlife  
Washington Department of Fish and Wildlife*

TO: Rock Peters, Northwestern Division, Corps of Engineers  
Bob Willis, Portland District, Corps of Engineers



FROM: Thomas K. Lorz, Vice Chairperson  
Fish Passage Advisory Committee

SUBJECT: Managing Bonneville Dam Screen System Debris

DATE: June 20, 2008

The salmon managers have concerns regarding current debris management at Corps' fishway facilities, especially at Bonneville Dam. These concerns focus on the present and future operation of the Bonneville Project with respect to meeting appropriate fish passage criteria and protocols. We have written this letter to initiate the process of improving debris management and minimize its impacts on the juvenile bypass system (JBS). The ultimate goal is to be able to operate the bypass system to meet criteria regardless of river flow and debris loads.

With the completion of "JBS guidance improvement" at Powerhouse II, problems have arisen associated with debris and its impacts on maintaining screen system criteria. In past years, under high flow and debris load conditions, the screens were not impacted to the extent witnessed this year by the debris load. This year, high fish descaling and other impacts to juvenile salmon have been a constant concern for much of this spring migration period.

Both the Bonneville II corner collector and the behavior guidance system in place aid in reducing JBS debris. However, the combination of adding the turning (flow) vane and gap closure devices as part of "JBS guidance improvement" to improve the guidance of juvenile salmon away from turbine units has likely lead to more flow and consequently debris being introduced into the gatewell.

While the Bonneville Dam personnel have been diligent in their efforts to keep the systems running, they have been constrained by the shortage of personnel and equipment to properly maintain system operation. The current BiOp modeling depends on the bypass system to insure

that project survival targets are met. The modeling assumes that survival targets can be met under all river conditions.

We believe that the issues listed below are major contributors of the existing problems. We outline these issues below and offer possible actions for improvements in an effort to meet the goal of operating the JBS and associated facilities to meet fish passage criteria, regardless of river conditions. We look forward to working with the Corps to resolve these problems as quickly as possible.

### Specific Problems

- 1) TIE Crane – The crane was identified as an important piece of equipment needed for operations at Powerhouse II. Two years ago the salmon managers recommended that repairs be completed as soon as possible. Due to a perceived lack of need for the TIE crane in the future, as well as funding issues for the agencies responsible for the repair of the TIE crane, repairs were not immediately started and the crane was not available for this season. As recently witnessed, without the TIE crane, VBS cleaning takes much longer and is less effective.
- 2) Intakes for auxiliary water supplies for the adult system have also been plagued by high debris loading, requiring them to be cleaned more frequently as well. With only one crane and limited crews available for cleaning both the Washington shore adult turbine intakes and vertical barrier screens (VBS), the time that can be spent cleaning the VBS is limited. It is troubling that several fishery agencies, notably NOAA and CRITFC, have continually requested automation of debris cleaning for those systems to reduce the need for a crane and a rigging crew. The Columbia River Fish Mitigation Program (CRFM) allocated funds to purchase a new system for the Washington Shore adult system. The system was purchased years ago but has not been installed. Repeated inquiries as to the timeline when it would be installed and operating have been left unanswered and no adequate answer for why the system has not been installed has been provided.
- 3) VBS sensors were reading low and had to be recalibrated, but additional errors in calibration continued requiring the COE to check VBS differential manually.
- 4) We commend the Bonneville Dam crew's diligence in working during the Friday through Monday shift to help clean the debris from the system, but with limited numbers of personnel available on the weekends, and with only one available crane, it is a nearly impossible to maintain the system.
- 5) One option that was not fully investigated was reducing the turbine loading to reduce the debris load into the gatewell and help to make the gatewell environment less turbulent and reduce any hotspots that may be present on the VBS screens.
- 6) Another option that was not fully considered or implemented prior to removal of the STS's was to conduct more aggressive VBS screen cleaning. With the TIE crane inoperable, the VBS's could not be removed and needed to be cleaned in place with the majority of the debris returned to the gatewell.

## Recommendations:

We offer the following initial recommendations for ideas and concepts to aid in the operation of the Bonneville JBS for all river conditions. Some of these may be applicable to other dam bypass systems. The region has prioritized a significant portion of program limited funds (i.e. \$65 million for the outfall relocation and JBS improvement and an additional \$17 million for “guidance improvement”) for juvenile screen system passage facilities at Bonneville Dam. There is a great need to insure that these system investments function optimally for all river conditions if the 2008 FCRPS BiOp survival goals are to be met in a timely fashion. We recommend that these recommendations provide the focus for FPOM deliberations.

- 1) Expedite repairs for the TIE crane to insure that it is operational for the next year’s outmigration.
- 2) Install the fish unit screen cleaners that have been purchased and begin identifying and installing automated screen cleaner systems on critical and problematic intakes and systems.
- 3) Routinely check the calibration of the VBS differential sensors.
- 4) Have a flex crew, or some additional personnel available to cover the Friday through Sunday time frame when additional personnel are needed during the high debris events or other emergencies. This may mean establishing a roving crew that can be utilized by several projects throughout the year or have additional crews ready for short periods of time when needed. There might be some opportunity to get additional personnel from other projects to cover as needed. These projects operate 7 days a week and there should be personnel available to maintain the project for that entire time.
- 5) Fully evaluate the benefits of reducing the turbine loading under high debris loading situations.
- 6) Fully evaluate the gatewell environment and determine the effects of the “guidance improvements” on overall fish condition and survival across the full range of powerhouse operations.
- 7) The decision to install screens should rest with the project personnel since they are able to monitor the situation better than others, but fish managers need to be able to review what criteria are being used to determine when the screens are reinstalled. Given the debris loads and the conditions now observed, some meaningful metric should be developed to determine when the screens can be redeployed this year. In future years the criteria may need to be revised since we should be able to deal more effectively with debris making it possible to redeploy the screens sooner.
- 8) Identify critical pieces of infrastructure that are needed to operate the projects and insure that they can be repaired or replaced in a timely manner so that issues such as the TIE crane do not impact the overall operation of a project.
- 9) Start investigating options that allow for controlling the flow into the gatewell independent of the turbine operations, or look at a permanent change to configurations of the “guidance improvements” that would allow for the screen system to be operated in a way that reduces flow and debris (e.g. removing the gap

closure, swapping out the turning vane with something else, a flapper valve on the VBS to reduce flow in the gateway, etc.).

- 10) The COE had suggested a more aggressive cleaning procedure that would not have installed a secondary VBS behind the primary VBS being cleaned. This would allow juveniles in the gateway to be flushed into the turbine units. However, without the secondary VBS in place, debris would have been free to pass out of the gateway and be flushed out through the turbine. We were not able to adequately test this technique to determine if it would have aided in keeping the system operating. A potential outline of a cleaning procedure was outlined in SOR#2008-04. This process should be fully evaluated.