March 2010

APPENDIX A

SPECIAL PROJECT OPERATIONS AND STUDIES

APPENDIX A: BONNEVILLE

Bonneville Dam[1]

1. Special Project Operations.

RCC will coordinate needed changes with the projects and authorize operations in teletype regulations.

1.1. Spill. Spill for fish passage will be provided during the spring and summer outmigration seasons in accordance with spill specifications in Appendix E and as coordinated through TMT. Alternative spill patterns to control dissolved gas levels or change fish passage conditions will be coordinated through the FPOM.

1.2. Spillway Erosion Monitoring. The Bonneville spillway ogees, pier noses, and stilling basin are badly eroded. The Corps has been monitoring the extent of this erosion through mid and post fish spill operation season surveys. In 2010, a mid season (approximately mid to late June) survey will be conducted. The survey will take approximately one-half day and require a full spillway outage. A post season survey will also be conducted. The survey will require shutting down adult attraction spill (bays 1 and 18) 1 bay at a time for a 2-hour period. The post season survey will be scheduled for late October / early November to minimize impacts on adult passage and provide enough time to use survey information for planning. FPOM and TMT will be coordinated with to determine the best timing for both surveys.

1.3. PH1 Turbine Rehabilitation Program and Turbine Commissioning. Bonneville Project is in the final phases of a 15 year turbine rehabilitation project at PH1. Units 7 & 9 remain out of service for rehab. Unit 9 is slated to return March and Unit 9 April 2010. Prior to return to service, the units have to undergo a series of commissioning tests that involve operating the unit throughout its full hydraulic operating range. These tests include loads above and beyond the 1% efficiency ranges for short durations as well as tests that deal with load rejections. Unit operations testing outside of the 1% range will be coordinated with the regional fish managers prior to testing and will be minimized as much as possible. Testing history and coordination from 8 previous units have produced little to no impacts on juvenile passage and is completed in a timely fashion to help limit unit operations outside the units 1% efficiency range. Also, once units have been cleared and are ready to be put online, a 72 hour heat run test will be started. This may require, depending on the time of year, a unit being put online at PH1 reducing the need to run a unit at PH2 during the fish passage season. As part of the acceptance testing a main unit needs to be operated at a specific load and kept on line for a minimum of 72 hours to pass commissioning.

1.4. PH2 Gatewell Hydraulics Testing. Modifications to turbine units at Bonneville Dam's second powerhouse (B2) have increased flows into the gatewell in an effort to enhance fish guidance efficiency. The modifications included installation of a gap-closure device on the intake ceiling, just downstream from the top edge of the submerged

[1] The purpose of this section is to notify regional interests of planned activities that will or may affect fish passage. Further coordination may occur as needed.

traveling screen (STS). In addition, a turning vane was installed just below the picking beam on the STS, and the size of the vertical barrier screen was increased (Ploskey et al. 2004). These changes increased the number of fish guided into the gatewell, and reduced loss of guided fish back into the turbine intake. However, little is known about hydraulic conditions in proximity to the VBS. High or shearing water velocity, or excessive turbulence in this region as well as high flows causing impingement have been investigated in studies from NOAA gatewell studies in 2009.

Hydraulic conditions in the gatewell may increase descaling or mortality for outmigrating smolts. Therefore more information is needed to determine what flow characteristics exist in the gatewell that could cause the injuries observed in Spring Creek fish.

Starting the week Feb 21, 2010 and continuing the week of 1 March, PNNL will conduct a study is to sample water velocities in the gatewell slot at Units 14A & 12A, from the entrance above the STS to the water surface and in close proximity to the vertical barrier screen (VBS) using Acoustic Doppler Velocimeters (ADV). Sampling will provide an estimate of velocity magnitude, and turbulence intensities that out-migrating smolts may encounters they pass through the gatewell. PNNL will deploy two ADVs in the gatewell at Unit 14A & 12A. Water velocities will be sampled from the bottom of the gatewell to the water surface in predetermined vertical increments and horizontally from one side of the gatewell to the opposite and in close proximity to the VBS providing x,y, z, and magnitude flow measurements. We will acquire water velocity data at four different turbine discharge levels: 17.8, 16.3, 14.7, and 12.0 kcfs. The anticipated duration of testing will be approximately 1 day per treatment. All test flow ranges will be conducted inside the 1% turbine efficiency range.

2. Studies.

2.1. Second Powerhouse Behavioral Guidance Structure (BGS) Biological Evaluation/Project Survival. A third passage season of acoustic telemetry will be used to evaluate juvenile salmonid response to the BGS, second powerhouse and corner collector as well as all other passage routes at BON in 2010. Equipment will not be installed on the BGS in 2010. Additional transducer trolley pipes will be installed in mid March at PH1. Existing pipes on the second powerhouse pier noses and spillway installed in 2008 will also be used. Hydrophones will again be deployed along the Washington and Oregon shorelines to monitor passage at PH1 and specifically the gap between BGS and shore, which may require BRZ permits.

2.2. Lamprey Passage Evaluations. From early June to the end of August, up to 1000 adult Pacific lamprey will be captured and tagged with half-duplex PIT tags and up to 300 will be radio-tagged and released below the dam to evaluate efficacy of Cascades Island fishway entrance modifications and overall passage, including use of the Lamprey Passage Systems (LPS). An additional 300 fish will be radio-tagged and half-duplex PIT tagged to evaluate detection efficiency for each system and to determine LPS use by radio-tagged fish. Access to antenna and receivers for downloading and maintenance will be needed from March through October. LPS and half duplex PIT antennas will be operational no later than the middle of May and run until at least October 1. Any new

antenna or receiver installations will be completed during the 2009-2010 IWW period. To evaluate the use of JSATS acoustic telemetry tags in adult Pacific lamprey studies and to determine the fate of adult lamprey in the FCRPS, 60 adult lamprey will be captured and tagged with a JSATS and half-duplex PIT tags. These JSATS-tagged fish will be released in the Bonneville Dam forebay and mobile tracked by boat through the reservoir reaches, tributary mouths, and tailraces of upstream dams.

2.3. Adult Salmon Studies Evaluations. From late March to June 1 600 adult Spring Chinook salmon will be captured and radio-tagged at the AFF and released below the dam to evaluate overall passage, with special focus on passage at the modified Cascade Island entrance. Access to antenna and receivers for downloading and maintenance will be needed from March until August. Any new antenna or receiver installations will be completed during the 2009-2010 IWW period.

2.4. Sea Lion Predation. Beginning when the first California sea lions return to Bonneville Dam until the last sea lion leaves, usually mid-November until June 1 (modifications to this date coordinated through FPOM), exclusion gates will be installed at all downstream slots of all entrances and barriers will be installed at B2 FOGs. In addition, NMFS-approved sea lion harassment activities will occur from land and water during sea lion season. The Fisheries Field Unit (FFU) will monitor sea lion predation and evaluate sea lion deterrent efforts from the powerhouse decks and the spillway public parking lot from early January through May 31.

2.5. Summary. All dates shown are approximate and could be advanced or delayed by a week or so depending on various factors such as river flows, contractor schedules, equipment failures, etc. Some evaluations may not proceed. Therefore, a final description of studies and outages being conducted will be coordinated with the region through AFEP (FFDRWG and SRWG), prior to April 1. All special operation requests or schedule changes will be coordinated with the fisheries agencies and tribes through the appropriate regional forum with the action agencies making the final decision.