Deleted: March
Deleted: 09

McNary Dam[1]

1 Special Project Operations.

1.1 Spill. Spill for fish passage will be provided during the outmigration season 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. During periods of high river flow, spill volumes and the elevation of McNary reservoir may need to be manipulated on a daily or every-other-day basis to provide safe conditions for loading the fish barge at the juvenile fish facility below the dam.

1.2 Doble Tests. Two transformer banks, T4, T5 and the respective turbine units will be taken out of service for Doble testing in 2010. Turbine units 7 and 8 will be unavailable for up to 4 days during T4 testing between 20 and 24 September 2010. Turbine units 9 and 10 will be out of service for up to four days during T5 testing 30 August to 2 September 2010. There may be some overlap between the 2 tests. Since McNary Dam has multiple transformer banks and transmission lines, and redundant switching capability, most turbine units will be available for operation during these tests. Turbine unit 1% efficiency operations and turbine priorities will continue to follow fish passage plan requirements. Outage dates will be coordinated with the region as they become available.

1.3 TSW Installation. TSW2 will remain in spillbay 20 for the spring fish passage season and will be removed for the summer fish passage season. TSW1 will be in Spillbay 19 for the spring fish passage season and also be removed for the summer fish passage season. The spill pattern for spring will be the same as 2008, but may be modified for the summer passage season.

1.4 Headgate Repair. This is a long term program to return the headgates to a safe operating condition by adding new roller chain, seals, anodes, and other miscellaneous components. The plan will require short unit outages throughout the year while transporting rebuilt gates from the turbine units to the repair pit and vice versa. Each swap will take from 4 to 6 hours to complete, and take place approximately every 2 months. Headgate movements are to take place concurrently with other outages as they occur, and no special operations outside the Fish Passage Plan are expected.

1.6 Navigation – Fish barge transit of tailrace. In order to safely allow juvenile fish barges to pass across the spillway tailrace, the project may temporarily reduce spill (to 0 kcfs if necessary) to safely allow the juvenile fish barge to transit the tailrace from the navigation lock and tie up at the loading facility. Once the barge is loaded and ready to leave the

[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.

Deleted: Four
Deleted: T1, T3, T6, T7
Deleted: 2009
Deleted: 1
Deleted: 2
Deleted: T1
Deleted: 9
Deleted: 12
Deleted: March
Deleted: 2009
Deleted: 5
Deleted: 6
Deleted: T3
Deleted: 24-27
Deleted: 2009
Deleted: . Turbine units 11 and 12 will be out of service for up to four days during T6 testing 21-23 September 2009 and turbine units 13 and 14 will be out of service for up to four days during T7 testing 28-30 September 2009.
Formatted: Indent: Left: 0", Hanging: 0.25", Hyphenate, Don't adjust space between Latin and Asian text, Don't adjust space between Asian text and numbers
Deleted: TSW1 is to be moved from spillbay 19 to spillbay 4 prior to the start of the 2009 spill season. This change will require a new spill pattern for a single treatment test. A new spill pattern has been accepted by the region for the 2009 fish passage season.¶
Formatted: Font: (Default) Times New Roman, 12 pt
Formatted: Font: (Default) Times New Roman, 12 pt
Formatted: Font: (Default) Times New Roman, 12 pt
Formatted: Font: 12 pt
Deleted: **1.5 New Turbine Unit Oil Coolers.** The existing turbine unit thrust bearing oil coolers are failing and are in need of replacement. The project has been replacing the internal oil coolers with external coolers as they fail. ... [1]
Formatted ... [2]
Formatted: Bullets and Numbering

facility, spill may again be reduced as needed until the barge has safely departed. Departure usually takes about 30 minutes to complete.

1.7 Waterfowl Nesting. From the end of April to the beginning of July, the McNary pool may be restricted to operations to elevations between 337.0 and 340.0 feet in support of waterfowl nesting on Lake Wallula. Pool elevations are also operated between 338.5 and 339.5 feet at least once every 4 days during daylight hours for a period of 4 to 6 hours. A yearly teletype has been issued to regulate the McNary pool in this fashion since at least 1982.

1.8 New 230 kv Transformer Installation: Installation of new main unit transformers for transformer banks T1 and T2, 3 transformers per bank, will be in the period July 2010-Oct 2010. The T2 transformer work is 1 July to 31 Aug 2010. The Government will shut down generator units 3 and 4 and de-energize transformer bank T2 on 1 July 2010. The installation for T2 is estimated to be complete and system in commercial operation not later than 31 August 2010. The T1 transformer work is 1 Sept, to 31 Oct, 2010. The Government will shut down generator units 1 and 2 and de-energize transformer bank T1 on 1 Sept, 2010. The installation for T1 is estimated to be complete and system in commercial operation not later than 31 October 2010.

1.9 Steady State Model Validation Testing. Western Electricity Coordinating Council requires steady state model validation testing on a periodic basis to ensure the generating equipment will meet real and reactive power ratings. All units will be tested on a 1-2 year cycle. Test will involve running the unit out of fish priority sequence and outside the 1% criteria. Testing can take place at any time except from 1 April to 31 August due to fish considerations. Tests will preferably be conducted just after unit annual maintenance, but may happen at other times. Tests will last for a standard of 30 minutes at maximum load with additional time to run the unit along the maximum real/reactive power curve to the minimum settings. Total test time is anticipated to be 90 minutes or less. Test durations will be minimized to the extent possible and will only be run for the purpose of completing the required model validation testing.

1.11 **Model Validation (Governor Step response)** Western Electricity Coordinating Council (WECC) requires a Governor response calibration to ensure the generating equipment responds as planned to system requirements and disturbances. Unit calibrations will be accomplished on all six units at Lower Granite. Calibration will involve running each unit in the manual GDACS mode and stepping the MW set point by 5 MW through the 1% range. To accomplish this, at least two other units will need to be operating in automatic to ensure a steady plant output while stepping through the operating range. This may result in operating units out of the sequence of the fish season priorities when calibrating units 4-6 if there is not sufficient water to operate four units. Each unit's calibration is expected to take approximately 1 day. Calibration will take place between March 29 and April 16.

1.12 Transient Model Validation (Exciter Step Response) McNary. Western Electricity Coordinating Council requires model validation testing on a five year minimum cycle to

Deleted: March
Deleted: 09
Formatted: Bullets and Numbering
Deleted: ¶
New 230 kv Transformer Installation: Installation of new main unit transformers for transformer banks T2, T4, and T5, 3 transformers per bank, will be in the period July 2009-Oct 2009. The Government will shut down generator units 7 and 8 and de-energize transformer bank T4 on 1 July 2009. The installation for T4 is estimated to be complete and system in commercial operation not later than 31 August 2009. The Government will shut down generator units 1 and 2 and de-energize transformer bank T2 on 1 July 2009. The installation for T2 is estimated to be complete and system in commercial operation not later than 31 August 2009. The Government will shut down generator units 9 and 10 and de-energize transformer bank T5 on 1 September 2009. The installation for T5 is estimated to be complete and system in commercial operation not later than 31 October 2009. A further installation for transformer bank T1, generator units 3 and 4, is scheduled for calendar year 2010.
Formatted: Font: Times New Roman
Formatted: Font: Times New Roman
Formatted: Indent: Left: 0", Hanging: 0.25"
Formatted: Font: Times New Roman
Formatted: Font: Times New Roman
Formatted: Font: Times New Roman
Formatted: Font: Times New Roman
Formatted: Indent: Left: 0", Hanging: 0.25"
Formatted: Bullets and Numbering
Deleted: **Periodic Inspection**. The McNary Dam Levee System (Tri-Cities Levees) are scheduled to be inspected on May 13 & 14, 2009. Most of the inspection is land based, but on the morning of May 14 we will be inspecting the levee riverward slope protection (RIP RAP) by boat and we request that the McNary Pool be lowered to as clo ... [3]
Formatted: Indent: Left: 0", Hanging: 0.25"
Deleted: 1.1.1
Formatted: Indent: Left: 0", Hanging: 0.25"
Deleted:

ensure the generating equipment responds to as planned to system requirements and disturbances. Unit tests will be accomplished on all 14 units at McNary. Testing will involve running the test unit out of fish priority sequence and outside the 1% criteria. Testing will take place at some time from October 1 to April 1 or at night during September; each unit will be run for approximately 1 hour with 30 minutes outside the 1% criteria. Test durations will be minimized to the extent possible.

1.13 Precise Level Surveys. Dam safety has scheduled the performance of Precise Level surveys at McNary Lock and Dam, in the February/March/April 2010 time frame. This requires the contracted surveyors to have a direct line of sight across the top of the embankment and roadway deck of the powerhouse, spillway, non-overflow sections, and Navigation lock and that the brass cap survey markers do not have anything set over the top of them.

1.14 Bridge Inspections. Bridges as appurtenance structures to the dam are inspected every two years based on the Federal DOT Bridge Inspection Program. Those Bridges include the Navigation lock upstream split Bascule Bridge, and the Fish Ladder Section 5 and Section 22 Bridge. Inspections require using a boat to inspect under the bridge in the Navigation forebay or the use of a snooper truck from the road way deck. No underwater inspection of piers will be accomplished.

1.15 Periodic Inspection. McNary Lock and Dam is scheduled to be inspected on March 23 & 24, 2009. Most of the inspection is land based, but on the morning of March 23 we will be inspecting the upstream and downstream face of the concrete dam, shore line, and embankment slope protection (RIP RAP) by boat. We will request that the McNary Pool be lowered to as close to 335 as possible as well as having a tailwater as low as possible. It may only be possible to get a forebay of between 336.5 or 337, but our goal is to get it as low as reasonably possible to expose as much areas of the project to look for damage. These inspections are accomplished once every five years and are being schedule prior to spilling for fish. We will also test the McNary spillway emergency generator prior to this inspection date. During the test we will raise as many of the spillway lift gates as possible with emergency power to maximize power usage and then close them.

1.16 Unit 2 and 7 rewind. Units 2 and 7 will be taken out of service July 1, 2010 through January 1, 2011 for winding and various other electrical and mechanical component replacements from the old excitation system down to the wicked gate servomotors. The McNary project intends to perform cavitation repair on these same units during the outage.

1.17 Asbestos Abatement. Units 2 and 7 will be taken out of service for asbestos abatement/cleanup for 1 month in March 2010.

2 Studies.

2.1 Developing a separator for Juvenile Lamprey. This study will require access to fish collection facilities at McNary Dam and access to the fish collection channel and orifice trap.

Deleted: March

Deleted: 09

Deleted: Testing will take place at some time from October 1 to April 1

Formatted: Indent: Left: 0", Hanging: 0.25"

Deleted: 2

Formatted: Indent: Left: 0", Hanging: 0.25"

Deleted: 13

Deleted: 14

Formatted: Font: Not Bold

Formatted: Font: Times New Roman, 12 pt

Formatted: Font: Bold

Formatted: Font: Not Bold

Formatted: Font: Bold

Formatted: Bullets and Numbering

Deleted: ¶
<#>**Evaluation of Juvenile Salmonid Passage, Behavior and Survival.** A passage, behavior, and survival study to evaluate the performance of two top-spill weirs (TSW) will again be conducted during the spring and summer of 2009. The configuration of these weirs will be changed from 2007-2008, and the ability to optimize passage through TSW's further investigated. The spring and summer evaluations will consist of a single project operation for each season – 40% spill in the spring and 50% spill in the summer. Equipment setup and installation requiring diving and considerable boat activity in the forebay BRZ will take place from February 18 through March 30. The spring evaluation will begin April 14 and continue into early June. The summer evaluation will begin later in June and continue until late July. ¶
¶
During the evaluations, juvenile salmonids will be collected at the juvenile fish facility for tagging with acoustic tags. The facility will alternate between days of primary bypass and secondary bypass in the spring (April 1 to approximately June 20). Within this time period (approximately April 14 to July 25) during days of primary bypass, the facility will switch to secondary bypass for up to a few hours each day to collect additional fish for tagging if necessary. Tagged fish will be released upstream of the project and monitored as they … [4]

Formatted: Indent: Left: 0", Hanging: 0.25"

Deleted: March

Deleted: 09

In addition, project assistance may be needed to obtain lamprey from bypass collection operations. No special turbine or spill operations will be necessary as al work will take place within the collection channel. Project assistance may be required during installation and removal of test screen material in the JBS exit raceways. Pacific lamprey macropthalmia and ammocoetes collected at the JBS are inadvertently transported downstream during barging and trucking operations to transport juvenile salmonids past dams. The ability to separate lamprey at these operations would allow release of both anadromous and resident lamprey juveniles back into the river after collection. Methods to separate lamprey at JBS exit raceways may provide insights into ways to reduce other sources of juvenile lamprey mortality at dams. Study is to continue in 2010, may be moved to Lower Monumental raceway.

Deleted: 2009

Formatted: Font: Bold

2.2 Evaluation of Adult Pacific Lamprey Passage Success at McNary and Lower Snake River Dams. This study will evaluate passage success for adult Pacific lamprey *Lampetra tridentata* at McNary Dam, Ice Harbor Dam, and the remaining lower Snake River dams and associated river segments using a combination of radio telemetry and half duplex passive integrated transponder (HD PIT) systems. Adult lamprey will be trapped in adult fishways at McNary dams, held and then tagged at the juvenile smolt sampling facility prior to release. This study will require McNary, Ice Harbor and potentially other Snake River dams to provide power for electronics equipment in the fishways and tailrace areas, access for the installation, repair, and testing of electronic and trapping equipment and access for the downloading of data from radio and PIT tag detection equipment. Some project crane support may be needed to install antennas in and near fishways. Maintenance and installation of equipment will occur during the winter maintenance period when adult fishways are dewatered. Work is continuing in 2010.

Formatted: Indent: Left: 0", Hanging: 0.25"

Formatted: Bullets and Numbering

Deleted: 2009

2.3 Video Monitoring of Adult Fish Ladder Modifications to Improve Pacific Lamprey Passage at the McNary Dam Oregon Shore Fishway, 2010. The Corps is planning to make some modifications to the Oregon shore fish ladder at McNary dam with the intent of improving upstream lamprey passage (reduce delay and increase ladder passage success). Modifications are planned in the tilting weir section of the upper Oregon shore fish ladder where a total of nine stem walls that support the tilting weirs will be modified to include lamprey orifices; two orifices per stem wall totaling 18 orifices. In addition to the lamprey orifices, metal plating will be installed over the top of three diffuser grating sections to aid lamprey attachment and improve lamprey passage at diffusers 12, 13, and 14 (between weirs 265-266, 268-269, and 271-272). This study will use video monitoring to determine if these new lamprey orifices delay or harm migrating ESA listed salmon and steelhead. Video monitoring will be used to determine if salmon and steelhead attempt to pass the lamprey orifices or are attracted to and thus delay passage as a result of attempted passage. Therefore, cameras will need to be positioned to capture video of fish behavior immediately downstream of weirs 335 and 336 and at one diffuser plating location.

Formatted: Indent: Left: 0", Hanging: 0.25"

Formatted: Underline

This study will require McNary to provide power for electronics equipment in the fishways, access for the installation, repair, and testing of electronic equipment and access for the downloading of data from video camera equipment. Some project support may be needed to

Formatted: Indent: Left: 0.25"

Deleted: March

Deleted: 09

install video cameras in and near fishways. Maintenance and installation of equipment will occur during the winter maintenance period when adult fishways are dewatered. Work is new in 2010.

2.4 Evaluation of Juvenile Salmonid Condition (descaling) Under Different Turbine Operating Conditions at McNary Dam. This study will generate fish condition information for run-of-the-river yearling and subyearling Chinook salmon, sockeye salmon, Coho salmon, and steelhead collected from orifice traps attached to the "A" gatewells in turbine units 4 and 5 at McNary Dam. The turbines will be operated at either the Best Operating Point (BOP) (13,400 – 14,000 cfs), or within 1% of the peak efficiency turbine rating curve (maximum of 12,355 cfs), depending on forebay head. Fish sampling and evaluations will begin on 1 May or as soon as sufficient numbers of fish are available and will continue through 30 June or until rising water temperatures limit the general handling of juvenile salmonids (typically this is not until early to mid-July).

Formatted: Indent: Left: 0", Hanging: 0.25"

Formatted: Bullets and Numbering

2.5 Evaluation of Juvenile Salmonid Gatewell Egress Using Updated Orifice Lighting Treatments at McNary Dam. This study will compare gatewell egress rates for juvenile run-of-the-river yearling and subyearling Chinook salmon, sockeye salmon, Coho salmon and steelhead under different orifice lighting treatments. The test gatewell at unit 6, slot B will be equipped with a standard vertical barrier screen (VBS) and extended length bar screen (ESBS). Fish will be collected and PIT tagged at the Juvenile Fish Collection Facility at McNary Dam. Gatewell egress will be measured with an in-line PIT detection system installed in the existing orifice trap at gatewell 6B and compared to each light treatment. During testing, unit 6 will be operated at 62 MW. Results of this study may result in improved orifice lighting strategies for future applications to USACE projects on the Snake and Columbia Rivers.

Formatted: Bullets and Numbering

The existing orifice trap will need to be modified in order to inject light into the orifice or to have a light device attached to the gatewell side of the orifice. Orifice trap modifications to the bypass channel will occur during the period when the orifice flow into the channel is shut down (January – March, 2010). Turbine loading will need to be held as constant as practicable at 62 MW. All fish for the study will be collected at McNary Dam. Changes in daily smolt monitoring sampling schedule and sample rates may be requested to meet daily target numbers for tagging. Collection operations at McNary Dam during April through July will be coordinated with the Project Fishery Biologist and the Smolt Monitoring Program personnel. NMFS personnel will require access to the juvenile fish collection channel at all hours during the orifice trap installation and study period.

Formatted: Font: Times New Roman

Formatted: Font: Times New Roman

Formatted: Font: Times New Roman

Formatted: Font: Times New Roman

Deleted: March
Deleted: 09

Ice Harbor Dam[1]

1. **Special Project Operations**.

1.1. Spill. Spill for fish passage will be provided during the outmigration season 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. Doble Tests. Two transformers, TW1 and TW2 and turbine units 1 and 2 will be taken out of service for Doble testing in 2010. The outage is tentatively scheduled for 23-27 August 2010. Since Ice Harbor Dam has multiple transformer banks and transmission lines, and redundant switching capability, the remaining turbine units will be available for operation during these tests. Turbine unit 1% efficiency operations and turbine priorities will continue to follow fish passage plan requirements during these tests.

1.3. Navigation. Short term adjustments in spill patterns, spill discharge rates and/or turbine operations may be required for navigational safety. This includes both commercial tows and fish barges.

1.4.

1.5. Steady State Model Validation Testing. Western Electricity Coordinating Council requires steady state model validation testing on a periodic basis to ensure the generating equipment will meet real and reactive power ratings. All units will be tested on a 1-2 year cycle. Test will involve running the unit out of fish priority sequence and outside the 1% criteria. Testing can take place at any time except from 1 April to 31 August due to fish considerations. Tests will preferably be conducted just after unit annual maintenance, but may happen at other times. Tests will last for a standard of 30 minutes at maximum load with additional time to run the unit along the maximum real/reactive power curve to the minimum settings. Total test time is anticipated to be 90 minutes or less. Test durations will be minimized to the extent possible and will only be run for the purpose of completing the required model validation testing.

1.6.Model Validation (Governor Step response) Western Electricity Coordinating Council (WECC) requires a Governor response calibration to ensure the generating equipment responds as planned to system requirements and disturbances. Unit calibrations will be accomplished on all six units at Lower Granite. Calibration will involve running each unit in the manual GDACS mode and stepping the MW set point by 5 MW through the 1% range. To accomplish this, at least two other units will need to be operating in automatic to ensure a steady plant output while stepping through the operating range. This may result in operating units out of the sequence of the fish season priorities when calibrating units 4-6 if there is not

[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.

Deleted: TW5
Deleted: 6
Deleted: 5
Deleted: 6
Deleted: 2009
Deleted: 6
Deleted: 2009

Deleted: <#>. **Ice Harbor RSW Tests.** Tests are tentatively scheduled for February or March. The RSW developed a significant vibration during the 2007 operating season, and underwent transition plate repairs in 2008. The RSW is to be monitored for any addition vibrations in 2009. CENWW may request short outages of the structure, adjacent spillbay, or Unit 6 to allow for installation of, or collection of vibration data. Should the severity of the vibration issue increase where structural integrity or safe operation of the Project are a concern the RSW will be removed from service. Either the spillway will be closed or the RSW stowed to allow for full spillway capacity. No additional outages are anticipated during the fish passage season to assist operation of the RSW.¶
¶
<#>**Ice Harbor North Shore AWS Fish Pumps.** Gear Reducers on Fish Pumps 1, 2, and 3 are being repaired. Pump 2 gear box is to be repaired by December 2, 2008, and the other 2 pump gearboxes are to be completed by March 23. Two pump operation is scheduled on March 1, 2009, while the backup work completion is by the week of March 22.¶

Formatted: Bullets and Numbering

Deleted: **Turbine Unit Priority Change**. A major transformer has failed at the Sacajawea¶
Substation which in turn restricts turbine operations at Ice Harbor Dam. Transformer design, build and replacement is expected to take a year or more to complete. Additionally, powerhouse transformer TW-6 is experiencing gassing during operation due to internal arcing or faults. Because of power distribution restrictions, the turbine unit priority will be 3, 1, 4, 5, 2 and 6 until the transformers are re… [5]

Deleted: ¶
<#>**Transformer TW-6** on Generating unit 6 has operability concerns and the oil is gassing when the unit is in oper… [6]

Formatted: Bullets and Numbering
Formatted: Bullets and Numbering

Deleted: March

Deleted: 09

sufficient water to operate four units. Each unit's calibration is expected to take approximately 1 day. Calibration will take place between March 29 and April 16.

1.7. Precise Level Surveys. Dam safety has scheduled the performance of Precise Level surveys at Ice Harbor Lock and Dam, in the February/March/April 2010 time frame. This requires the contracted surveyors to have a direct line of sight across the top of the embankment and roadway deck of the powerhouse, spillway, non-overflow sections, and Navigation lock and that the brass cap survey markers do not have anything set over the top of them.

1.8. Bridge Inspections. Bridges as appurtenance structures to the dam are inspected every two years based on the Federal DOT Bridge Inspection Program. Those Bridges include the spillway road way deck bridge, and the Navigation lock downstream Bridge. Bridge inspections require using a boat to inspect under the bridge in the spillway forebay or the use of a snooper truck from the road way deck. No underwater inspection of piers will be accomplished. Inspection of the spillway bridges will be attempted to be accomplished before the spill season.

Deleted: <#> **Transient Model Validation (Exciter Step Response) for Ice Harbor**. Western Electricity Coordinating Council requires model validation testing on a five year minimum cycle to ensure the generating equipment responds to as planned to system requirements and disturbances. Unit tests will be accomplished on all 6 units. Testing will involve running the test unit out of fish priority sequence and outside the 1% criteria. Testing will take place in September; each unit will be run for approximately 1 hour with 30 minutes outside the 1% criteria. Test durations will be minimized to the extent possible.¶

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

2. Studies.

2.1 Evaluation of Adult Pacific Lamprey Passage Success at McNary and Lower Snake River Dams. This study will evaluate passage success for adult Pacific lamprey *Lampetra tridentata* at McNary Dam, Ice Harbor Dam, and the remaining lower Snake River dams and associated river segments using a combination of radio telemetry and half duplex passive integrated transponder (HD PIT) systems. Adult lamprey will be trapped in adult fishways at McNary Dam, held and then tagged at the juvenile smolt sampling facility prior to release. This study will require McNary, Ice Harbor and potentially other Snake River dams to provide power for electronics equipment in the fishways and tailrace areas, access for the installation, repair, and testing of electronic and trapping equipment and access for the downloading of data from radio and PIT tag detection equipment. Some project crane support may be needed to install antennas in and near fishways. Maintenance and installation of equipment will occur during the winter maintenance period when adult fishways are dewatered.

Deleted: ¶
<#>**Evaluate the Impacts of Avian Predation on Salmonid Smolts from the Columbia and Snake Rivers.** This is a continuation of a pilot study to determine how various biotic and abiotic factors are associated with differences in steelhead smolt vulnerability to predation by Crescent Island terns and Foundation Island cormorants. The study request PIT tagging both hatchery and wild steelhead collected in the smolt monitoring sample at Lower Monumental and Ice Harbor dams from April though-July. The recorded condition of a fish will be attached to a specific tag code and vulnerability to avian predation will be evaluated using PIT tag recovery data collected from the avian bird colonies. A sample of 500 fish per week is desired. Some collection will take place prior to the start of the regular transport season. The number of fish desired means the collection at times will exceed the numbers of fish needed to determine fish condition. Some fish will also be held greater than the maximum 2 days normally allotted.¶

Formatted: Bullets and Numbering

Deleted: ¶
<#>**Evaluation of juvenile fish passage and survival at Ice Harbor Dam**. Fish released upstream and downstream of Lower Monumental Dam will be monitored for passage route and survival (route specific and concrete survival). Forebay and tailrace behavior and residence time will also be monitored. There will be no tailrace release of reference fish at Ice Harbor in 2009, so survival estimates will be done using single release model. One operation is anticipated at this time.¶

Deleted: March
Deleted: 09

Lower Monumental Dam[1]

Deleted: ¶
Deleted: ¶
Deleted: ¶

1. Special Project Operations.

Formatted: Font: Bold

1.2. Spill. Spill for fish passage will be provided during the outmigration season 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. During periods of high river flow, spill volumes and the elevation of Lower Monumental reservoir may need to be manipulated on a daily or every-other-day basis to provide safe conditions for loading the fish barge at the juvenile fish facility below the dam.

Deleted: ¶
Formatted: Font: Bold
Formatted: Indent: Left: 0", Hanging: 0.25"
Deleted: ¶

1.3 Doble Tests. Transformer bank T1 and turbine units 1, 2, 3, and 4 will be taken out of service for Doble testing in 2010. The outage is tentatively scheduled for 26-30 July 2010. This work will require a total powerhouse outage, and 100% spill (except for station service) for up to 4 hours. By then, all clearance tags should be hung, and the line could be re-energized allowing generation availability of Units 5 and 6. Turbine unit 1% efficiency operations and turbine priorities will continue to follow fish passage plan requirements during these tests. Another total plant outage will be required on the last day of testing to remove clearance tags and restore T1 bank.

Deleted: 5
Deleted: 6
Formatted: Font: Bold
Formatted: Bullets and Numbering
Deleted: ¶
Formatted: Font: Bold
Deleted: T2
Deleted: 2009
Deleted: 22-25 June 2009
Deleted: 1-4
Deleted: T2
Formatted: Font color: Auto
Formatted: Font: Bold
Deleted: ¶

1.4 Navigation. Tailrace Transit – Fish Transportation Barge. Transit across the Lower Monumental tailrace, docking at and disembarking from the fish collection facility requires some degree of flow control depending on tug/barge size and power, wind, pilot experience, current and other factors. Spill needs to be reduced to the level needed for safe passage. Towboat captain may request zero spill during this transit. During juvenile fish loading operations, spill is typically reduced to 15 kcfs, but can be reduced further if needed for safety reasons. Loading periods can take up to 3.5 hours. Because of the time needed to complete loading, the Little Goose Project Biologist notifies the Little Goose Operator when the fish barge departs. BPA scheduling is then provided advance notice for spill control at Lower Monumental Dam. Reducing spill may cause Lower Monumental project to briefly operate outside of MOP conditions.

Deleted: operated
Deleted: ¶
¶
RSW. CENWW may request short outages of the structure or adjacent spillbay, or Unit 6 should adjustments need to be made to either the RSW or biological monitoring equipment during the fish passage season. When the RSW is in operation, the spillgate shall be raised to where it does not touch flow passing down the RSW. Vertical fish distributions, passage injury and mortality will be investigated during the 2009 season.**Turbine Fire Suppression System:** Currently, all six turbine units are protected by a single CO_2 fire protection system. When a single turbine unit is being serviced, the entire fire protection system is shut down as a safety precaution. New valves are to be installed so that individual turbine units can be isolated from the fire prote ... [7]

1.5 Precise Level Surveys. Dam safety has scheduled the performance of Precise Level surveys at Lower Monumental Lock and Dam, in the February/March/April 2010 time frame. This requires the contracted surveyors to have a direct line of sight across the top of the embankment and roadway deck of the powerhouse, spillway, non-overflow sections, and Navigation lock and that the brass cap survey markers do not have anything set over the top of them.

Deleted: ¶
Deleted: ¶

1.6 Bridge Inspections. Bridges as appurtenance structures to the dam are inspected every two years based on the Federal DOT Bridge Inspection Program. Those Bridges include the spillway road way deck bridges and the Navigation lock downstream Bridge. Inspections

Formatted ... [8]

[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.

require using a boat to inspection under the bridge in the spillway forebay or the use of a snooper truck from the road way deck. No underwater inspection of piers will be accomplished. Inspection of the spillway bridges will be attempted to be accomplished before the spill season.

1.7 Steady State Model Validation Testing. Western Electricity Coordinating Council requires steady state model validation testing on a periodic basis to ensure the generating equipment will meet real and reactive power ratings. All units will be tested on a 1-2 year cycle. Test will involve running the unit out of fish priority sequence and outside the 1% criteria. Testing can take place at any time except from 1 April to 31 August due to fish considerations. Tests will preferably be conducted just after unit annual maintenance, but may happen at other times. Tests will last for a standard of 30 minutes at maximum load with additional time to run the unit along the maximum real/reactive power curve to the minimum settings. Total test time is anticipated to be 90 minutes or less. Test durations will be minimized to the extent possible and will only be run for the purpose of completing the required model validation testing.

1.8 Model Validation (Governor Step response) Western Electricity Coordinating Council (WECC) requires a Governor response calibration to ensure the generating equipment responds as planned to system requirements and disturbances. Unit calibrations will be accomplished on all six units at Lower Granite. Calibration will involve running each unit in the manual GDACS mode and stepping the MW set point by 5 MW through the 1% range. To accomplish this, at least two other units will need to be operating in automatic to ensure a steady plant output while stepping through the operating range. This may result in operating units out of the sequence of the fish season priorities when calibrating units 4-6 if there is not sufficient water to operate four units. Each unit's calibration is expected to take approximately 1 day. Calibration will take place between March 29 and April 16.

3 Studies

2.1 Bull Trout PIT Tag Study. Incidental bull trout passing through the Lower Monumental Juvenile Fish Facility will be collected and held for PIT tag insertion, then released through the Lower Monumental primary bypass outfall. Project duration begins and ends with scheduled juvenile fish facility operations. No special turbine or spill operations will be necessary.

2.2 Developing a separator for Juvenile Lamprey. Juvenile lamprey collected at McNary may be moved to the Lower Monumental Juvenile Fish Facility raceways to study behavior and passage success through the LMO raceway screen material. No special project or facility operations are expected for the research.

Deleted: March
Deleted: 09
Deleted: ¶
Formatted: Indent: Left: 0", Hanging: 0.25"
Deleted: 1.6
Deleted: ¶
Formatted: Font: Bold
Deleted: ¶ 1.7 .
Formatted: Indent: Left: 0", Hanging: 0.25"
Deleted: **Transient Model Validation (Exciter Step Response) for Lower Monumental**. Western Electricity Coordinating Council requires model validation testing on a five year minimum cycle to ensure the generating equipment responds to as planned to system requirements and disturbances. Unit tests will be accomplished on all 6 units. Testing will involve running the test unit out of fish priority sequence and outside the 1% criteria. Testing will take place in September; each unit will be run for approximately 1 hour with 30 minutes outside the 1% criteria. Test durations will be minimized to the extent possible.¶ ¶
Formatted: Indent: Left: 0", Hanging: 0.25"
Formatted: Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, … + Start at: 2 + Alignment: Left + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.25"
Formatted: Indent: Left: 0", Hanging: 0.25"
Formatted: Bullets and Numbering
Deleted: **Studies.**
Deleted: ¶ ¶
Deleted: 2.1.¶ **Evaluate the Impacts of Avian Predation on Salmonid Smolts from the Columbia and Snake Rivers.** This is a continuation of a pilot study to determine how various biotic and abiotic factors are associated with differences in steelhead smolt vulnerability to predation by Crescent Island terns and Foundation Island cormorants. The study request PIT tagging both hatchery and wild steelhead collected in the smolt monitoring sample at Lower Monumental and Ice Harbor dams from April though-July. Th… [9]
Deleted: ¶
Deleted: 2.2

Deleted: March
Deleted: 09

Little Goose Dam[1]

1 Special Project Operations.

1.1 Spill. Spill for fish passage will be provided during the outmigration season 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 Navigation. Short term adjustments in spill patterns, spill discharge rates and/or turbine operations may be required for navigational safety. This includes both commercial tows and fish barges.

1.3 Doble Tests. Transformer bank T1 and turbine units 1, 2, 3, and 4 will be taken out of service for Doble testing in 2010. The outage is tentatively scheduled for 2 - 6 August 2010. This work will require a total powerhouse outage, and 100% spill (except for station service) for up to 4 hours. By then, all clearance tags should be hung, and the line could be re-energized allowing generation availability of Units 5 and 6. Turbine unit 1% efficiency operations and turbine priorities will continue to follow fish passage plan requirements during these tests. Another total plant outage will be required on the last day of testing to remove clearance tags and restore T1 bank.

1.4 Little Goose Dam – Primary Dewaterer Repairs. The primary dewaterer is to undergo modification and repairs in conjunction with work on the bypass flume. This work is to be completed by March 1. Should inclement weather or other construction issues be encountered, completion may be delayed further into March.

1.5 Steady State Model Validation Testing. Western Electricity Coordinating Council requires steady state model validation testing on a periodic basis to ensure the generating equipment will meet real and reactive power ratings. All units will be tested on a 1-2 year cycle. Test will involve running the unit out of fish priority sequence and outside the 1% criteria. Testing can take place at any time except from 1 April to 31 August due to fish considerations. Tests will preferably be conducted just after unit annual maintenance, but may happen at other times. Tests will last for a standard of 30 minutes at maximum load with additional time to run the unit along the maximum real/reactive power curve to the minimum settings. Total test time is anticipated to be 90 minutes or less. Test durations will be minimized to the extent possible and will only be run for the purpose of completing the required model validation testing.

[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.

Deleted: ¶
Deleted: T2
Deleted: 5 and 6
Deleted: 2009
Deleted: 17-20
Deleted: 2009
Deleted: 1-4
Deleted: T2
Formatted: Bullets and Numbering

Deleted: **Little Goose Dam – Underwater Sounding Inspections.** Underwater sounding safety inspections of the Little Goose Dam stilling basin and channel are planned in September 2009. These soundings are required to be conducted once every 5 years. This will require changes in turbine unit priorities and some restrictions in spill. Water surface is monitored on a continuous basis to determine and account for causes of changes in elevations. During the surveys, turbine units nearest the stilling basin will not be in use, and no spills will be taking place to avoid water level fluctuations.¶
Little Goose Dam – Juvenile Full Flow Pit Tag Detector. A new full flow PIT tag detector is to be installed in the bypass flume. Once in operation PIT tag detection will be possible without passing fish through the collection and transport facility. Included in this contract is the relocation of the bypass outfall to the current PIT tag outfall. The new outfall will route fish downstream of strong eddies that form under some spill conditions. Although work is to be completed by March 1, inclement weather or other construction issues may delay completion further into March.¶

Deleted: <#>**Turbine Operations.** To enhance juvenile passage survival, turbines at Little Goose will be operated within 1% of peak efficiency during the juvenile and adult migration seasons (April 1 through October 31). (See appendix C, Corps of Engineers 2008 Fish Passage Plan).¶
¶
Additionally, during the juvenile migration season (through Aug 31 or until the 300 fish collection criteria allows spill to be curtailed), the lower operating limit of unit 1 will be r ... [10]

Formatted: Bullets and Numbering
Formatted: Indent: Left: 0", First line: 0"
Deleted: [1]

1.6 Precise Level Surveys. Dam safety has scheduled the performance of Precise Level surveys at Little Goose Lock and Dam, in the February/March/April 2010 time frame. This requires the contracted surveyors to have a direct line of sight across the top of the embankment and roadway deck of the powerhouse, spillway, non-overflow sections, and Navigation lock and that the brass cap survey markers do not have anything set over the top of them.

1.7 Bridge Inspections. Bridges as appurtenance structures to the dam are inspected every two years based on the Federal DOT Bridge Inspection Program. Those Bridges include the spillway road way deck Bridges, and the Navigation lock downstream pedestrian Bridge and the upstream upper and downstream lower bascule bridges. Inspections require using a boat to inspection under the bridge in the spillway forebay or the use of a snooper truck from the road way deck. No underwater inspection of piers will be accomplished. Inspection of the spillway bridges will be attempted to be accomplished before the spill season.

1.8 Transient Model Validation (Exciter Step Response) Little Goose. Western Electricity Coordinating Council requires model validation testing on a five year minimum cycle to ensure the generating equipment responds to as planned to system requirements and disturbances. Unit tests will be accomplished on all 6 units at Little Goose. Testing will involve running the test unit out of fish priority sequence and outside the 1% criteria. Testing will take place at some time from October 1 to April 1 or at night during September; each unit will be run for approximately 1 hour with 30 minutes outside the 1% criteria. Test durations will be minimized to the extent possible.

1.9 Model Validation (Governor Step response) Western Electricity Coordinating Council (WECC) requires a Governor response calibration to ensure the generating equipment responds as planned to system requirements and disturbances. Unit calibrations will be accomplished on all six units at Lower Granite. Calibration will involve running each unit in the manual GDACS mode and stepping the MW set point by 5 MW through the 1% range. To accomplish this, at least two other units will need to be operating in automatic to ensure a steady plant output while stepping through the operating range. This may result in operating units out of the sequence of the fish season priorities when calibrating units 4-6 if there is not sufficient water to operate four units. Each unit's calibration is expected to take approximately 1 day. Calibration will take place between March 29 and April 16.

2. Studies.

2.1 Bull Trout PIT Tag Study. Incidental bull trout passing through the Little Goose Juvenile Fish Facility will be collected and held for PIT tag insertion, then released through the Little Goose primary bypass outfall. Project duration begins and ends with scheduled juvenile fish facility operations. No special turbine or spill operations will be necessary. Study continues in 2010.

Deleted: March

Deleted: 09

Formatted: Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … + Start at: 6 + Alignment: Left + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.25"

Formatted: Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … + Start at: 6 + Alignment: Left + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.25"

Formatted: Bullets and Numbering

Deleted: ¶
1.8

Deleted: Testing will take place at some time from October 1 to April 1

Formatted: Bullets and Numbering

Deleted: ¶
<#>**Direct Injury Study.** A contractor will make fish releases beginning on about March 11, 2009 and continuing until about March 28, in spill bays 1 and 8. Spill in bay 1 will be over the new TSW with the high and low crest at approximately 6.7 and 10.7 kcfs of spill, respectively. Spill in bay 8 will be approximately 7 kcfs. Additional spill may be determined by the Project at whatever level is necessary to simulate TSW egress under normal spill operations. The Contractor will require multiple spill stoppage on a daily basis throughout the study in order to safely enter the tailrace BRZ to retrieve tagged fish. There are no anticipated turbine outages necessary for this study. No conflicts with the radio-telemetry study are anticipated as the direct injury study is scheduled to conclude prior to initiation of regular fish passage spill on April 5.¶
¶
<#>**A Study to Determine Migration Behavior and Survival of Juvenile Salmonids.** A radio telemetry survival and behavior study will be conducted with yearling and sub-yearling Chinook and hatchery steelhead through Little Goose Dam during the spring and summer migration in 2009. Radio telemetry equipment set-up will begin in February and continue until the end of March. Smolts will be radio tagged, released upstream of the project, and monitored as they pass the project beginning in mid-April. Spill over the adjustable crest temporary spillway weir (TSW) will be evaluated using the 2008 BiOp spill of 30%, 24-hours a day for the spring season. The TSW crest v … [11]

Formatted: Bullets and Numbering

Deleted: 2009

Deleted: March
Deleted: 09

Lower Granite Dam[1]

1 Special Project Operations.

1.1 Spill. Spill for fish passage will be provided during the outmigration season 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. During periods of high river flow, spill volumes and the elevation of Lower Granite reservoir may need to be manipulated on a daily or every-other-day basis to provide safe conditions for loading the fish barge at the juvenile fish facility below the dam.

1.2 Doble Tests. Transformer bank T1 and turbine units 1, 2, 3, and 4 will be taken out of service for Doble testing in 2010. The outage is tentatively scheduled for 16-20 August 2010. This work will require a total powerhouse outage, and 100% spill (except for station service) for up to 4 hours. By then, all clearance tags should be hung, and the line could be re-energized allowing generation availability of Units 5 and 6. Turbine unit 1% efficiency operations and turbine priorities will continue to follow fish passage plan requirements during these tests. Another total plant outage will be required on the last day of testing to remove clearance tags and restore T1 bank.

1.3 Navigation at Lower Granite Dam. When spill at Lower Granite is greater than 60 kcfs, there is a danger of having the fish barge being pushed upstream into the dam, causing a hazardous situation. Under these conditions, spill is reduced to 60 kcfs when fish transport barges approach or leave the barge dock. This reduction should be limited to no more than 1 hour. The project biologist will notify the control room prior to a barge leaving the loading dock so that spill can be reduced.

1.5 Precise Level Surveys. Dam safety has scheduled the performance of Precise Level surveys at Lower Granite Lock and Dam, in the February/March/April 2010 time frame. This requires the contracted surveyors to have a direct line of sight across the top of the embankment and roadway deck of the powerhouse, spillway, non-overflow sections, and Navigation lock and that the brass cap survey markers do not have anything set over the top of them.

1.6 Bridge Inspections. Bridges as appurtenance structures to the dam are inspected every two years based on the Federal DOT Bridge Inspection Program. Those Bridges include the spillway road way deck bridges and the spillway gate trunnion pedestrian bridges, the Navigation lock downstream Bridge, and the south shore project access Bridges, and upstream construction facility Bridge. Inspections require using a boat to inspect under the bridge in the spillway forebay or the use of a snooper truck from the road way deck. No

[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.

Deleted: T2
Deleted: 5 and
Deleted: 6
Deleted: 2009
Deleted: 10-13
Deleted: 2009
Deleted: 1-4
Deleted: T2

Deleted: <#>**Power System Stabilizer (PSS) installation on Units 4, 5, 6.** Units will be scheduled OOS for approximately 1 week (one unit at a time) to perform the physical installation of PSS. After physical installations are complete, each unit will then be scheduled OOS (one unit at a time) for 1 to 2 days to tie in to existing system and commission each PSS. These outages are estimated to begin in late July to late August during mandatory spill season when river flows are low.¶
¶
<#>**Arc Flash.** Data collection to establish PPE levels or changes to equipment will require various unit outages for personnel safety for 1 hour on 6 different occasions to open cabinet doors for verification purposes between April and Nov 2008, then again between March and September 2009.¶
¶

Formatted: Bullets and Numbering

Deleted: <#>**100 Ton Intake Crane Outage.** The 100 Ton intake crane is scheduled to be OOS for rehab October thru January. We would be looking at 3 units (4,5, & 6) OOS from Oct 1 thru Dec 15 for having the fish screens removed early. In addition, then we would again be looking at 3 units (1,2, & 3) OOS from Dec 15 thru the end of Jan for having fish screens installed and no operational juvenile bypass system (shut down for winter).¶
¶
<#>The Fish Passage related issue is the installation of Hydraulic cylinders on Units 4 & 6, from Dec 15 thru the end of Jan, units 4 & 6 would not be in compliance with running units with the head gates up, dogged off and cylinder removed. We would need a waiver to deviate from the FPP here. The benefit to installation of cylinders would be to allow for unit annuals on 4 & 6 d ... [12]

Formatted ... [13]

Formatted: Font: Times New Roman

Formatted ... [14]

Deleted: March

Deleted: 09

underwater inspection of piers will be accomplished. Inspection of the spillway bridges will be attempted to be accomplished before the spill season.

Deleted:

Formatted: Indent: First line: 0.04"

Deleted:

Formatted: Bullets and Numbering

1.7 Steady State Model Validation Testing. Western Electricity Coordinating Council requires steady state model validation testing on a periodic basis to ensure the generating equipment will meet real and reactive power ratings. All units will be tested on a 1-2 year cycle. Test will involve running the unit out of fish priority sequence and outside the 1% criteria. Testing can take place at any time except from 1 April to 31 August due to fish considerations. Tests will preferably be conducted just after unit annual maintenance, but may happen at other times. Tests will last for a standard of 30 minutes at maximum load with additional time to run the unit along the maximum real/reactive power curve to the minimum settings. Total test time is anticipated to be 90 minutes or less. Test durations will be minimized to the extent possible and will only be run for the purpose of completing the required model validation testing.

Formatted: Bullets and Numbering

1.8 Transient Model Validation (Exciter Step Response) Lower Granite. Western Electricity Coordinating Council requires model validation testing on a five year minimum cycle to ensure the generating equipment responds to as planned to system requirements and disturbances. Unit tests will be accomplished on all 6 units at Lower Granite. Testing will involve running the test unit out of fish priority sequence and outside the 1% criteria. Testing will take place at some time from October 1 to April 1 or at night during September; each unit will be run for approximately 1 hour with 30 minutes outside the 1% criteria. Test durations will be minimized to the extent possible.

Deleted: Testing will take place at some time from October 1 to April 1

Formatted: Bullets and Numbering

1.9 Model Validation (Governor Step response) Western Electricity Coordinating Council (WECC) requires a Governor response calibration to ensure the generating equipment responds as planned to system requirements and disturbances. Unit calibrations will be accomplished on all six units at Lower Granite. Calibration will involve running each unit in the manual GDACS mode and stepping the MW set point by 5 MW through the 1% range. To accomplish this, at least two other units will need to be operating in automatic to ensure a steady plant output while stepping through the operating range. This may result in operating units out of the sequence of the fish season priorities when calibrating units 4-6 if there is not sufficient water to operate four units. Each unit's calibration is expected to take approximately 1 day. Calibration will take place between March 29 and April 16.

Deleted:

1.10 Unit 3 rewind. Unit 3 will be rewound and will be out of service between July 1, 2010 and December 31, 2010. Additionally, Unit 3 will be out of service for asbestos abatement March 1, 2010 to March 31, 2010.

Formatted: Bullets and Numbering

1.11 Headgate Repair. This is a long term program to return the headgates to a safe operating condition by adding new roller chain, seals, anodes, and other miscellaneous components. The plan will require short unit outages throughout the year while transporting rebuilt gates from the turbine units to the repair pit and vice versa. Each swap will take from 4 to 6 hours to complete, and take place approximately every 2 months. Headgate movements are to take place concurrently with other outages as they occur, and no special operations outside the Fish Passage Plan are expected.

January 2010

Deleted: March

Deleted: 09

Deleted: ¶
¶
¶
Page Break
¶
¶

2 Studies.

2.1 A study to compare seasonal SARs of early in-river migrating versus transported Snake River yearling anadromous salmonids. A study will be conducted to determine seasonal effects of transporting fish from the Snake River to optimize a transportation strategy. At Lower Granite, fish will be collected for this study starting on approximately April 5, with marking beginning on April 6, 2010. Depending on the number of fish available, fish will be collected 1-2 days with tagging occurring on the day following collection. A barge will leave each Thursday morning with all fish collected during the previous 1-3 days. By barging all fish (minus the in-river group) during 1 to 3 days of collection, barge densities will be maintained at a level similar to what would occur under normal transport operations that time of year. This pattern will occur in the weeks preceding general transportation and will be incorporated into general transportation once that operation begins. The desired transported sample size is 6,000 wild Chinook and 4,000 - 6,000 wild steelhead weekly for approximately eight weeks.

Formatted: Indent: Left: 0", Hanging: 0.25"

Deleted: 09

Formatted: Font: Bold

2.2 Bull Trout PIT Tag Study. Incidental bull trout passing through the Lower Granite Juvenile Fish Facility will be collected and held for PIT tag insertion, the released to the Lower Granite primary bypass outfall. Project duration begins and ends with scheduled juvenile fish facility operations. No special turbine or spill operations will be necessary. Study continues in 2010.

Formatted: Indent: Left: 0", Hanging: 0.25"

Formatted: Bullets and Numbering

Deleted: 2009

2.3 A study to compare SARs of Snake River fall Chinook salmon under alternative transportation and dam operational strategies. A sample of Subyearling Chinook salmon will be collected at Lower Granite juvenile fish facility using the sort by code system. Fish will be measured and compared to fish captured at Bonneville Dam to determine growth for in-river migrants. Sort by code will also be used to collect holdover fall Chinook juveniles in the spring. Scale samples will be collected from returning adults at the adult trap using sort by code.

Formatted: Indent: Left: 0", Hanging: 0.25"

Formatted: Bullets and Numbering

2.4 Kelt reconditioning / transportation. Provide assistance to post spawn steelhead collected at Lower Granite separator either by transportation, temporary rearing and feed, or other measures to determine the feasibility and success of these alternatives for rehabilitation to support increased steelhead population growth.

Formatted: Indent: Left: 0", Hanging: 0.25"

Formatted: Font: Bold

Formatted: Font: Bold

2.5 A Study to Evaluate Hydropower System-related Latent Mortality Associated with Passage of Yearling Chinook Salmon Smolts through Snake River Dams. This study will test the hypothesis of hydropower system-related latent mortality that was promoted as an explanation for the difference in life-cycle productivity between upstream and downstream populations of spring/summer Chinook salmon prior to and after dam construction. Three groups of hatchery-reared yearling Chinook salmon smolts will be PIT tagged at Lower Granite Dam on the Snake River. One group will be transferred by truck and released below Ice Harbor Dam; a second group will be transported an identical amount of time by truck before being released into the Lower Granite Dam tailrace; a third group will be released into the Lower Granite Dam tailrace without having been transported by truck.

Formatted: Font: Bold

January 2010

Deleted: March

Deleted: 09

Formatted: Indent: Left: 0", Hanging: 0.25"

Page 1: [1] Deleted Greg Moody 1/8/2010 12:57:00 PM

1.5 New Turbine Unit Oil Coolers. The existing turbine unit thrust bearing oil coolers are failing and are in need of replacement. The project has been replacing the internal oil coolers with external coolers as they fail. The plan is to replace the remaining oil coolers during planned outages rather than through forced outages after internal oil cooler failure. This work started in July, 2007 and will continue into February 2009. No special operations are planned.

Page 1: [2] Formatted Greg Moody 12/14/2009 11:20:00 AM

Indent: Left: 0", Hanging: 0.25"

Page 2: [3] Deleted Greg Moody 11/23/2009 7:12:00 AM

Periodic Inspection. The McNary Dam Levee System (Tri-Cities Levees) are scheduled to be inspected on May 13 & 14, 2009. Most of the inspection is land based, but on the morning of May 14 we will be inspecting the levee riverward slope protection (RIP RAP) by boat and we request that the McNary Pool be lowered to as close to 335 as possible for both days. These inspections are accomplished once every five years. There are several levees located in Richland, Pasco, Kennewick, and Finely. It may be only possible to get 336.5 or 337, but as I requested as low as possible. The inspection team will look for damage or benching of the slope protection and since we can not see below the water level it works better if we can have a lower pool elevation. May 13 is the land based inspection and the morning of May 14 **Trilateration surveys**. Dam safety has scheduled the performance of Trilateration surveys at McNary in the February/March 2009 time frame. This requires the contracted surveyors to have a direct line of site to the upstream face of the dam and access to survey point across the parapet walls and spillway piers on the upstream face of the dam.

Page 3: [4] Deleted Greg Moody 12/11/2009 1:05:00 PM

Evaluation of Juvenile Salmonid Passage, Behavior and Survival. A passage, behavior, and survival study to evaluate the performance of two top-spill weirs (TSW) will again be conducted during the spring and summer of 2009. The configuration of these weirs will be changed from 2007-2008, and the ability to optimize passage through TSW's further investigated. The spring and summer evaluations will consist of a single project operation for each season – 40% spill in the spring and 50% spill in the summer. Equipment setup and installation requiring diving and considerable boat activity in the forebay BRZ will take place from February 18 through March 30. The spring evaluation will begin April 14 and continue into early June. The summer evaluation will begin later in June and continue until late July.

During the evaluations, juvenile salmonids will be collected at the juvenile fish facility for tagging with acoustic tags. The facility will alternate between days of primary bypass and secondary bypass in the spring (April 1 to approximately June 20). Within this time period (approximately April 14 to July 25) during days of primary bypass, the facility will switch to secondary bypass for up to a few hours each day to collect additional fish for tagging if necessary. Tagged fish will be released upstream of the project and monitored as they enter the forebay and pass the project. Also during the evaluation, daily boat access to the forebay BRZ will be

required for equipment maintenance. Equipment removal is currently expected to take place after spill ceases during September. There is a chance that other work at the project may necessitate delaying equipment removal until October.

A single treatment test with a 40% spill level is planned for spring. The summer would also be a single treatment 50% spill regime based on the results from testing during 2006-2008. Treatment schedules and the test spill patterns have been developed and coordinated through SRWG and FFDRWG.

Page 1: [5] Deleted **Greg Moody** **11/23/2009 10:12:00 AM**

Turbine Unit Priority Change. A major transformer has failed at the Sacajawea Substation which in turn restricts turbine operations at Ice Harbor Dam. Transformer design, build and replacement is expected to take a year or more to complete. Additionally, powerhouse transformer TW-6 is experiencing gassing during operation due to internal arcing or faults. Because of power distribution restrictions, the turbine unit priority will be 3, 1, 4, 5, 2 and 6 until the transformers are replaced. It is anticipated that the Sacajawea transformer will be replaced in late FY09; at this time unit 1 and 3 priority will be switched.

Lightning Arrestor Installation. New lightning arrestors are to be installed on the powerhouse 115kV bus structure. This will require the following outages:
8/3/09 – 8/14/09 Units 5 and 6
8/17/09 – 8/21/09 Units 3 and 4
8/24/09 – 8/28/09 Units 1 and 2.
To the extent practical (manpower limited), unit annuals will be aligned with the buswork outages to limit the number of unit annuals. These outage dates are approximate and may vary by start date and length.

NERC Reactive Limit Testing. Reactive limit testing is required for generator owners to be performed every two years. The test quantitatively measures machine performance limits to ensure it is capable of providing protective functions during grid disturbances and to ensure it is not a contributor to these disturbances. The test requires exit from the best 1% efficiency range to ensure the reactive limits of the generator can be met and held for a period of time, typically 15 minutes (Scheduled for the winter maintenance period).

Periodic Inspection. Ice Harbor is scheduled for a periodic Inspection for March 31, 2009. These inspections are only scheduled once every five years. Inspect the upstream and downstream face of the dam by boat and will be requesting Minimum Operating Pool (MOP) to see as much of the dam's wetted surface as possible. Need as low a tailwater and forebay as possible. No voluntary spill on that day, if possible. The inspection team will also be scheduling testing of the operations of the spillway gates on emergency power. This is accomplished by operating as many gates under emergency power by lifting the gates up one foot then lowering them. The test can be done up to 30 days in advanced of the actual periodic inspection and may only take a couple of hours. Water will be spilled through the gates and we will be operating as many as we can by raising them up one foot then lowering them.

Trilateration surveys. Dam safety has scheduled the performance of Trilateration surveys at Ice Harbor in the February/March 2009 time frame. This requires the contracted surveyors to have a direct line of site to the upstream face of the dam and access to survey point across the parapet walls and spillway piers on the upstream face of the dam.

Page 1: [6] Deleted **Greg Moody** **12/11/2009 12:53:00 PM**

Transformer TW-6 on Generating unit 6 has operability concerns and the oil is gassing when the unit is in operation. Part of the effort to maximize reliability of this transformer includes the purchase and installation of an oil purification unit. An outage of unit 6 is planned for the week of May 4, 2009 to allow installation of the oil purifier components on the transformer. Start up testing and verification of the oil purification unit is planned for the week of May 11, 2009. This will likely require the operation of unit 6 outside the unit priority requirements.

Page 1: [7] Deleted **Greg Moody** **12/16/2009 1:57:00 PM**

RSW. CENWW may request short outages of the structure or adjacent spillbay, or Unit 6 should adjustments need to be made to either the RSW or biological monitoring equipment during the fish passage season. When the RSW is in operation, the spillgate shall be raised to where it does not touch flow passing down the RSW. Vertical fish distributions, passage injury and mortality will be investigated during the 2009 season.**Turbine Fire Suppression System:** Currently, all six turbine units are protected by a single CO_2 fire protection system. When a single turbine unit is being serviced, the entire fire protection system is shut down as a safety precaution. New valves are to be installed so that individual turbine units can be isolated from the fire protection system and turbine units in normal operation continue to be protected. A single outage lasting a maximum of 2 days will be required to complete this work.

Lower Monumental Dam – Underwater Sounding Inspections. Underwater sounding safety inspections of the Lower Monumental Dam stilling basin and channel are planned in September 2009. These soundings are required to be conducted once every 5 years. This will require changes in turbine unit priorities and some restrictions in spill. Water surface is monitored on a continuous basis to determine and account for causes of changes in elevations. During the surveys, turbine units nearest the stilling basin will not be in use, and no spills will be taking place to avoid water level fluctuations. Winter time tests are impractical as this is the time of peak power demand and the highest likelihood of pool fluctuations.

Trilateration surveys. Dam safety has scheduled the performance of trilateration surveys at Lower Monumental Lock and Dam in the February/March 2009 time frame. This requires the contracted surveyors to have a direct line of site to the upstream face of the dam and access to survey point across the parapet walls and spillway piers on the upstream face of the dam.

Page 1: [8] Formatted **Greg Moody** **12/16/2009 1:56:00 PM**

Indent: Left: 0", Hanging: 0.25"

Page 2: [9] Deleted Greg Moody 12/16/2009 1:52:00 PM

2.1.

Evaluate the Impacts of Avian Predation on Salmonid Smolts from the Columbia and Snake Rivers. This is a continuation of a pilot study to determine how various biotic and abiotic factors are associated with differences in steelhead smolt vulnerability to predation by Crescent Island terns and Foundation Island cormorants. The study request PIT tagging both hatchery and wild steelhead collected in the smolt monitoring sample at Lower Monumental and Ice Harbor dams from April though-July. The recorded condition of a fish will be attached to a specific tag code and vulnerability to avian predation will be evaluated using PIT tag recovery data collected from the avian bird colonies. A sample of 500 fish per week is desired. Some collection will take place prior to the start of the regular transport season.

Lower Monumental RSW Post Construction Evaluation. A radio telemetry passage and survival study will be conducted with yearling Chinook, juvenile steelhead, and sub-yearling Chinook salmon through Lower Monumental Dam during the spring and summer of 2009. This research is designed to measure progress toward meeting performance standards as outlined in the 2008 FCRPS Biological Opinion (NMFS 2008). Radio telemetry equipment installation will begin in February and continue until the end of March, 2009. Smolts will be radio tagged, released upstream of the project, and monitored as they pass the project beginning in mid-April 2009. Spill using a high-gate opening alternate bay configuration will be evaluated compared to a flat pattern to maximize passage through the RSW and survival through both the RSW and spillway as in 2008. Additionally, a vertical fish distribution study will be undertaken at the entrance to the RSW in spring and summer 2009. The vertical distribution of fish entrained in the RSW flow from its entrance to the crest will be evaluated and compared to direct injury data collected in 2008 where deep released juvenile salmon were found to have an elevated occurrence of injury compared to shallow releases.

Lower Monumental RSW Post Construction Evaluation – Study Fish. Some or most of the test fish for the Lower Monumental RSW survival evaluation will be taken from the Lower Monumental juvenile fish facility daily sample during spring and summer juvenile migrations in 2009. If insufficient numbers of fish are available for tagging at the Lower Monumental juvenile fish facility on a daily basis, fish will be taken from the Little Goose juvenile fish facility.

Page 1: [10] Deleted Greg Moody 11/23/2009 12:51:00 PM

Turbine Operations. To enhance juvenile passage survival, turbines at Little Goose will be operated within 1% of peak efficiency during the juvenile and adult migration seasons (April 1 through October 31). (See appendix C, Corps of Engineers 2008 Fish Passage Plan).

Additionally, during the juvenile migration season (through Aug 31 or until the 300 fish collection criteria allows spill to be curtailed), the lower operating limit of unit 1 will be manually re-set as indicated.

Little Goose Unit 1 2009 Spill Season Operating Limits

Lower Limit	Upper Limit	Condition
1% Lower Generation Limit (Varies w/Head)	1%Upper Generation Limit (Varies w/Head)	With extended-length submersible bar screens installed. Powerhouse Discharge ≤ 16 kcfs
115 MW (16 kcfs)*	1%Upper Generation Limit (Varies w/Head)	With extended-length submersible bar screens installed. Powerhouse Discharge > 16 kcfs
1% Lower Generation Limit (Varies w/Head)	1%Upper Generation Limit (Varies w/Head)	Without extended-length submersible bar screens installed. Powerhouse Discharge ≤ 17.5 kcfs
125 MW (17.5 kcfs)*	1%Upper Generation Limit (Varies w/Head)	Without extended-length submersible bar screens installed. Powerhouse Discharge > 17.5 kcfs

See Tables LGS-6 to 9 for the 1% Generation Limits at specific heads at the following link: . http://www.nwd-wc.usace.army.mil/tmt/documents/fpp/2009/sections/09_LGS.pdf
Discharges are approximate.

Historic operation within the GDACS program tended to balance flows out of any units in operation. This year's operation will, at times, result in an unbalanced operation where more flow is passing through unit 1 than other operating units. A heavier flow out of unit 1 has been shown in the Little Goose physical model to be very important in disrupting the eddy that tends to form along the south shore downstream of the powerhouse. Disrupting the eddy optimizes the tailrace conditions for both adult passage and juvenile egress with the temporary spillway weir operating in spillway bay 1.

Trilateration surveys. Dam safety has scheduled the performance of Trilateration surveys at Little Goose Lock and Dam Reservoir in the February/March 2009 time frame. This requires the contracted surveyors to have a direct line of site to the upstream face of the dam and access to survey point across the parapet walls and spillway piers on the upstream face of the dam.

Page 2: [11] Deleted **Greg Moody** **12/1/2009 3:13:00 PM**

Direct Injury Study. A contractor will make fish releases beginning on about March 11, 2009 and continuing until about March 28, in spill bays 1 and 8. Spill in bay 1 will

be over the new TSW with the high and low crest at approximately 6.7 and 10.7 kcfs of spill, respectively. Spill in bay 8 will be approximately 7 kcfs. Additional spill may be determined by the Project at whatever level is necessary to simulate TSW egress under normal spill operations. The Contractor will require multiple spill stoppage on a daily basis throughout the study in order to safely enter the tailrace BRZ to retrieve tagged fish. There are no anticipated turbine outages necessary for this study. No conflicts with the radio-telemetry study are anticipated as the direct injury study is scheduled to conclude prior to initiation of regular fish passage spill on April 5.

A Study to Determine Migration Behavior and Survival of Juvenile Salmonids. A radio telemetry survival and behavior study will be conducted with yearling and sub-yearling Chinook and hatchery steelhead through Little Goose Dam during the spring and summer migration in 2009. Radio telemetry equipment set-up will begin in February and continue until the end of March. Smolts will be radio tagged, released upstream of the project, and monitored as they pass the project beginning in mid-April. Spill over the adjustable crest temporary spillway weir (TSW) will be evaluated using the 2008 BiOp spill of 30%, 24-hours a day for the spring season. The TSW crest will be changed for summer spill (subyearling Chinook passage) when project discharge falls below 75 kcfs for at least three consecutive days.

The goals of this study include: (1) Determine the timing and route of passage for yearling and sub-yearling Chinook salmon, and juvenile steelhead relative to TSW spill and powerhouse operations; (2) Estimate route-specific survival of hatchery yearling and sub-yearling Chinook and hatchery steelhead; (3) Determine the effects of TSW operation and associated training spill, as well as powerhouse operations, on smolt approach paths in the forebay of Little Goose Dam.

Radio tag antennas will be placed on the dam in order to cover selected passage routes, as well as in the forebay and tailrace of Little Goose Dam.

Dive work (and associated turbine and spill outages) may be necessary to install spillway and powerhouse antennas. Antenna repair and installation may also be necessary on the ESBSs and VBSs. Dive work will be necessary for replacing one damaged trolley pipe in spillway 2 between spillways 2 and 3. The research biologists may also need access to the BRZ for radio tracking antenna placement if barges are necessary to obtain the passage information needed.

Page 1: [12] Deleted **Greg Moody** **12/1/2009 3:15:00 PM**

100 Ton Intake Crane Outage. The 100 Ton intake crane is scheduled to be OOS for rehab October thru January. We would be looking at 3 units (4,5, & 6) OOS from Oct 1 thru Dec 15 for having the fish screens removed early. In addition, then we would again be looking at 3 units (1,2, & 3) OOS from Dec 15 thru the end of Jan for having fish screens installed and no operational juvenile bypass system (shut down for winter).

The Fish Passage related issue is the installation of Hydraulic cylinders on Units 4 & 6, from Dec 15 thru the end of Jan, units 4 & 6 would not be in compliance with running units with the head gates up, dogged off and cylinder removed. We would need a waiver to deviate from the FPP here. The benefit to installation of cylinders would be to allow for unit annuals on 4 & 6 during the time period Oct 1 thru Dec 15, in addition, between Dec 15 and end of Jan, two of the three units available would have the ability to lower head gates in the event of a governor problem, and then could be worked on and brought back into service, if not, they could be out the whole duration.

Trilateration surveys. Dam safety has scheduled the performance of Trilateration surveys at Lower Granite Lock and Dam, in the February/March 2009 time frame. This requires the contracted surveyors to have a direct line of site to the upstream face of the dam and access to survey point across the parapet walls and spillway piers on the upstream face of the dam.

Page 1: [13] Formatted **Greg Moody** **12/11/2009 2:11:00 PM**

```
Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … +
Start at: 5 + Alignment: Left + Aligned at:  0" + Tab
after:  0.25" + Indent at:  0.25"
```

Page 1: [14] Formatted **Greg Moody** **12/11/2009 2:12:00 PM**

```
Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … +
Start at: 5 + Alignment: Left + Aligned at:  0" + Tab
after:  0.25" + Indent at:  0.25"
```