

APPENDIX A

SPECIAL PROJECT OPERATIONS AND STUDIES

APPENDIX A: BONNEVILLE

Bonneville Dam¹

1. Special Project Operations.

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

1.1. Spring Creek Hatchery Release. The first hatchery release is expected to occur in mid-March, followed by spill for juvenile fish passage until such time as passage rates drop back to low levels. Spill levels and duration of special operations will be determined in coordination with fish agencies through TMT. Project operations for fish passage will be defined by RCC teletype prior to the release.

1.2. Spill. Spill will be provided continuously from April 10 through August 31 for spring and summer migrants as required in the NMFS Biological Opinions. An evaluation of the daytime spill cap (75 kcfs) versus daytime spill to the gas cap is planned for 2002. Table SPO-BON-1 outlines the schedule for this test, which consists of a randomized 4-day block design (2-day treatments).

2. Studies.

2.1. Bonneville Rehab Biological Testing (also testing under the Turbine Survival Program. Main unit 5 will need to be commission tested once it returns to service in August 2002. The unit will undergo a series of pre-startup tests that will require the unit's STSs to be removed. A normal pre-start scenario is to mechanically roll the unit for 1 day. After the unit has been deemed structurally sound, the unit will be HIPOT tested for 2-3 days. After this test series is complete the unit is subjected to several load rejection tests that require the STSs to be removed (2 days). The unit's STSs will be reinstalled and then be advanced to a 72 hour run test, followed by the 100 day commissioning test.

2.2. Lower Columbia River Adult Study. Adult salmon (1100 spring/summer chinook and 1100 fall chinook), 1100 steelhead and 200 lamprey will be captured at the adult fish monitoring facility and tagged with radio transmitters from April through October 2002. In addition to assessing general migration

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characteristics, there are two salmon and steelhead elements that are specific to Bonneville Dam. They are an evaluation of potential south shore fishway exit and evaluating passage and fallback with the new deflectors installed at the spillway. For the south shore exit evaluation, 10 fish per species, per week will be released at two sites along the new navigation lock wing wall and one site on the Oregon shore. Their behavior and migrations paths will be evaluated using fixed receivers and by mobile tracking. Access to boating restricted zones (BRZ) will be required. For the spillway fallback evaluation, we will compare fallback rates between spill and no-spill periods. This test will utilize a randomized block design, with 2-day treatments within 4-day blocks. The test will run the entire spill period, 10 April - 31 August (See Table SPO-BON1 below).

Adult Pacific lamprey passage will be evaluated using radio telemetry. Two modifications to adult fishways will be assessed for their potential to improve passage success. Additional strips of 12" wide plating will be installed on diffuser gratings in Washington shore's north upstream entrance (NUE) through the ladder's transition. Plating will be installed during the winter maintenance period using divers if the ladder is not completely dewatered. Passage success and times through the area will be compared to those of adjacent entrances, and with previous years. Also, a prototype lamprey bypass system will be installed and tested in the Bradford Island ladder AWS channel where lamprey congregate. Passage through different configurations of an attraction end into a guidance and collection pipe will be evaluated using 10 nighttime releases of 10 visually marked lamprey/release directly into the AWS channel and by evaluating attraction of unmarked lamprey. Tests will also be conducted in the lamprey test flume within the AFF to better understand lamprey behavior in ladders. Behavior of salmonids and lamprey at the Washington ladder weir orifices and overflows will be evaluated with underwater cameras and telemetry.

An evaluation of the extent of sea lion predation on adult salmonids will begin with systematic observations of pinniped in all three tailraces from March to mid May.

Table SPO-BON-1. Daytime spill treatments for evaluating adult passage at Bonneville Dam in 2002. Three-day treatments alternate between the existing 75 kcfs daytime cap and spill to the 120% TDG cap. See Table BON 6 for daytime spill hours.

Date	Treatment	Date	Treatment	Date	Treatment	Date	Treatment
10-Apr	TDG Cap	16-May	TDG Cap	21-Jun	TDG Cap	27-Jul	TDG Cap
11-Apr	TDG Cap	17-May	TDG Cap	22-Jun	TDG Cap	28-Jul	TDG Cap
12-Apr	75 kcfs	18-May	75 kcfs	23-Jun	75 kcfs	29-Jul	75 kcfs
13-Apr	75 kcfs	19-May	75 kcfs	24-Jun	75 kcfs	30-Jul	75 kcfs
14-Apr	75 kcfs	20-May	75 kcfs	25-Jun	75 kcfs	31-Jul	75 kcfs
15-Apr	75 kcfs	21-May	75 kcfs	26-Jun	75 kcfs	1-Aug	75 kcfs
16-Apr	TDG Cap	22-May	TDG Cap	27-Jun	TDG Cap	2-Aug	TDG Cap
17-Apr	TDG Cap	23-May	TDG Cap	28-Jun	TDG Cap	3-Aug	TDG Cap
18-Apr	TDG Cap	24-May	TDG Cap	29-Jun	TDG Cap	4-Aug	75 kcfs
19-Apr	TDG Cap	25-May	TDG Cap	30-Jun	TDG Cap	5-Aug	75 kcfs
20-Apr	75 kcfs	26-May	75 kcfs	1-Jul	75 kcfs	6-Aug	TDG Cap
21-Apr	75 kcfs	27-May	75 kcfs	2-Jul	75 kcfs	7-Aug	TDG Cap
22-Apr	TDG Cap	28-May	75 kcfs	3-Jul	TDG Cap	8-Aug	TDG Cap
23-Apr	TDG Cap	29-May	75 kcfs	4-Jul	TDG Cap	9-Aug	TDG Cap
24-Apr	75 kcfs	30-May	TDG Cap	5-Jul	75 kcfs	10-Aug	75 kcfs
25-Apr	75 kcfs	31-May	TDG Cap	6-Jul	75 kcfs	11-Aug	75 kcfs
26-Apr	75 kcfs	1-Jun	TDG Cap	7-Jul	75 kcfs	12-Aug	75 kcfs
27-Apr	75 kcfs	2-Jun	TDG Cap	8-Jul	75 kcfs	13-Aug	75 kcfs
28-Apr	TDG Cap	3-Jun	75 kcfs	9-Jul	TDG Cap	14-Aug	TDG Cap
29-Apr	TDG Cap	4-Jun	75 kcfs	10-Jul	TDG Cap	15-Aug	TDG Cap
30-Apr	75 kcfs	5-Jun	75 kcfs	11-Jul	TDG Cap	16-Aug	75 kcfs
1-May	75 kcfs	6-Jun	75 kcfs	12-Jul	TDG Cap	17-Aug	75 kcfs
2-May	TDG Cap	7-Jun	TDG Cap	13-Jul	75 kcfs	18-Aug	TDG Cap
3-May	TDG Cap	8-Jun	TDG Cap	14-Jul	75 kcfs	19-Aug	TDG Cap
4-May	75 kcfs	9-Jun	TDG Cap	15-Jul	TDG Cap	20-Aug	TDG Cap
5-May	75 kcfs	10-Jun	TDG Cap	16-Jul	TDG Cap	21-Aug	TDG Cap
6-May	TDG Cap	11-Jun	75 kcfs	17-Jul	75 kcfs	22-Aug	75 kcfs
7-May	TDG Cap	12-Jun	75 kcfs	18-Jul	75 kcfs	23-Aug	75 kcfs
8-May	TDG Cap	13-Jun	75 kcfs	19-Jul	75 kcfs	24-Aug	75 kcfs
9-May	TDG Cap	14-Jun	75 kcfs	20-Jul	75 kcfs	25-Aug	75 kcfs
10-May	75 kcfs	15-Jun	TDG Cap	21-Jul	TDG Cap	26-Aug	TDG Cap
11-May	75 kcfs	16-Jun	TDG Cap	22-Jul	TDG Cap	27-Aug	TDG Cap
12-May	75 kcfs	17-Jun	75 kcfs	23-Jul	TDG Cap	28-Aug	75 kcfs
13-May	75 kcfs	18-Jun	75 kcfs	24-Jul	TDG Cap	29-Aug	75 kcfs
14-May	TDG Cap	19-Jun	TDG Cap	25-Jul	75 kcfs	30-Aug	TDG Cap
15-May	TDG Cap	20-Jun	TDG Cap	26-Jul	75 kcfs	31-Aug	TDG Cap

2.3. Fish Passage Efficiency (FPE). FPE research will be conducted at all three structures (First Powerhouse, Second Powerhouse, and Spillway) to evaluate FPE for the spring and summer passage seasons. Primary evaluation techniques will be hydroacoustics and radio telemeter. No specific project operations or unit priorities are needed for this study, they will follow the spill test for the adult program (see table SPO-BON1). However, unit outages will be required for the installation and removal of monitoring equipment. Further,

unit outages likely will be needed to fix broken or non-functional equipment within the evaluation timeframe (April through July).

2.4. Movement, Distribution, and Passage Behavior of Radio-Tagged Juvenile Salmonids at Bonneville Dam Associated with the Surface Bypass Program. Access to the project Boat Restricted Zone (BRZ) will be required for conducting this study. Besides this, no specific operational requirements are expected.

2.5. Flat Plate PIT Tag Detection of Juvenile Salmonids at the First Powerhouse Smolt Monitoring DSM. The installation and testing of this equipment is not expected to require any special project operations. However, since this program is in the developmental phase, and water control within the DSM is questionable, possible problems with the operation may arise. In the case of needed repairs to the system, one or two occasions of one or two-hour reversal of flow through this system may be required to adjust the equipment. No serious effects to fish passage are expected.

2.6. Yearling Chinook Delayed Mortality Evaluation. A pilot study to assess the effects of juvenile fish transportation and passage through bypass systems will be conducted at the Second Powerhouse Smolt Monitoring Facility. Yearling chinook will be captured at the facility and placed into holding tanks supplied with artificial seawater. Fish will be held in these tanks from 4-6 months. This study will require no special project operations. It will run from approximately April through December.

2.7. Project Survival Evaluation. Project survival for juvenile fish, and route specific survival will be evaluated in 2002 at Bonneville lock and Dam. Primary technology will be radio telemetry, with both powerhouses and the spillway monitored. Route-specific survival will be evaluated for: (1) spillway, (2) existing juvenile bypass system (JBS) at B1 (collection channel downstream through the outfall), and (3) through one Minimum Gap Runner (MGR) turbine units at B1 (priority will be main unit 6). Research at B1 JBS and MU 6 MGR will likely be spring passage season only.

Unit outages will be required for the installation and removal of monitoring equipment. Further, there will likely be the need for unit outages in order to fix broken or non-functional equipment within the evaluation timeframe (April through July). Specific project operations required will be main unit 6 as a priority unit for the spring passage season/evaluation. Main unit 6 will take the priority place of

main unit 2.

2.8. Prototype Testing of FGE Improvements at Bonneville Second Powerhouse. In 2002, prototype testing of a turning vane, gap closure device, and larger VBS will be conducted. Testing will begin in late April and conclude in late July. FGE testing will be conducted nightly and will require the test unit to be shut down nightly for short periods for removal and placement of the fyke nets and STS. The required outage will be for approximately 1-2 hours.

In addition to the fyke net test above, hydroacoustics will be used to estimate FGE (WES and PNNL). For the WES deployment, transducers will be installed both on the STS and on the trash racks prior to the test start date. Testing will be completed on 14 July. Installation on both the trash racks and STS will require a one-day outage. As always, several outages should be expected throughout the testing season to repair equipment.

It is expected that the test unit will be available for normal operation during non-testing periods (unless significant fish injury is seen) to meet project/regional needs.

2.9. 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 AFEP and with RCC and BPA.

APPENDIX A: THE DALLES

The Dalles Dam¹

1. Special Project Operations

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

1.1. Spill. Spill will be provided continuously from April 10 through August 31 for spring and summer migrants as required in the NMFS BiOp.

2. Studies.

In 2002, juvenile salmonid survival studies, and an evaluation of a prototype surface flow bypass system will be conducted. Survival estimates will be generated for the project as a whole, and for the spillway. The focus of spillway survival work in 2002 will be to determine whether there is direct injury and mortality occurring in the stilling basin. For surface bypass studies, intake occlusions will be evaluated for their ability to decrease turbine entrainment. The occlusion structures will be placed in front of both fish units and main units 1-5 (possibly 1-4). All structures will be kept in place or removed above the water according to a random block design (see Table 1, SPO-TDA). Each treatment will last three days, a block will last six days. One full day will likely be required to move the occlusions in or out to set up for the next treatment. The turbine unit at an intake occlusion will need to be shut down each time the structure is moved.

2.1. Project Survival Evaluation. Survival estimates for spillway passed fish will be generated using radio telemetry and balloon tag techniques. Test fish will be passed through three spillways via release hoses. Control fish will be released downstream of the end sill via a hose, and by boat downstream of the highway 197 bridge. For the direct test (balloon-tag method), key variables that will be assessed include spill discharge and tailwater elevation. During testing, which will occur from 0700-1700 hours for two weeks in May and two weeks in June, it will be important to minimize fluctuations in tailwater elevation and spill discharge volumes. How this will be accomplished needs to be developed closer to the passage season, when more accurate information on river flow and power demand is available. To monitor stilling basin passage routes and residence times for radio-tagged fish,

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an underwater antenna array will be installed along the end sill. This array will also be used to assess sensor packet and balloon-tagged fish travel routes. To conduct these evaluations, tailrace BRZ access is required. To install or relocate release hoses; three spillgates at a time will need to be closed approximately 4 hours per hose. The hydraulic environment encountered by test fish in the tailrace will be characterized using autonomous sensors released through the spillway hoses and by measuring pressure changes on two baffle blocks and the end sill. Pressure transducers will be installed on the baffle blocks and end sill at spillway bays 4 and 9. Pressure data will be collected prior to the fish spill season. The spillway gates at unit 4 and 9 would be ramped open at a 1 foot opening, a 2 foot opening, a 3 foot opening, a 4 foot opening, a 5 foot opening, a 6 foot opening and a 7 foot opening. This operation is anticipated to occur between 0700 hours and 1700 hours for one day in early April. These preliminary data would provide a measure of the pressure for various gate opening when the instrumentation is new and has the highest probability of working. If installation of the pressure transducers is too close to the spill season, the first time that spill is initiated adjacent bays should be open first and then bays 4 and 9. This sequence will minimize the initial load on the pressure transducers.

2.2. FPE and Blocked Trashrack Evaluations. FPE will be evaluated at The Dalles Dam using hydroacoustic and radio telemetry techniques. Unit outages for deployment of equipment will be required beginning in April and will likely include outages of most units to accommodate diver mounted equipment. In-season outages may also be required for equipment repair. Hydroacoustic and Telemetry equipment will also be deployed at the spillway. Equipment will be removed after the study and will require similar outages as installation.

The Blocked Trashrack portion of the study will take advantage of the equipment for other studies, but may need additional outage of Units 1-5 for additional deployment of equipment. Main units 1-5 will be operated on a first on/last off operational priority during the test period. Unit priority will then (if possible) be 6 through 22 (west end units first on/last off). The study will follow a random block treatment with J-Blocks in/out following the schedule in **Table 1, SPO-TDA**. The unit(s) will need to be out of service during the movement of the J-Blocks.

2.3. Behavioral Studies. Tracking split-beam sonar will be used to collect data within 15 m of one turbine unit (1-4). An acoustic Doppler current profiler will also be deployed to

monitor real time hydraulics. These studies are under development.

2.4. Adult Salmon and Steelhead Passage Evaluations. Radio telemetry will be used to monitor for adult salmon and steelhead as part of a basin-wide adult passage study. There are no tests specific to The Dalles Dam for this study and no special operations required.

2.5. Equipment Installation and Maintenance. Installation of hydroacoustic transducers, radio telemetry equipment, and the release mechanisms for the survival studies will begin in February at The Dalles Dam. Installation of spillway transducers will occur early March. If there is involuntary spill at that time, spill gates will need to be closed for the installation. The gate in one bay at a time will be closed. Installation of hydroacoustic equipment at the powerhouse and sluiceway will require turbine unit outages to allow for diver access. It will take approximately two weeks in mid to late March to install and align all of the transducers at the powerhouse. Three turbine units will be out of service for approximately 8 hours each day beginning at 0800 hrs. Fish units will be taken out of service one at a time and require two evenings for transducer installation. Fish unit outages will occur only after dark. Typically, we can expect approximately 12 transducer failures over the three-month period. Each failure will require a turbine unit outage of approximately four hours. If a dive is required to repair the problem, the two adjacent units will be out of service as well.

Table 1. SPO-TDA

Block	Spring Date	Julian Day	Day of Week	Treatment	Study Day	Summer Date	Julian Day	Day of the Week	Treatment	Study Day
1	20-Apr	110	Sat	Occluded	1	1-Jun	152	Sat	Unoccluded	43
1	21-Apr	111	Sun	Occluded	2	2-Jun	153	Sun	Unoccluded	44
1	22-Apr	112	Mon	Occluded	3	3-Jun	154	Mon	Unoccluded	45
1	23-Apr	113	Tue	Unoccluded	4	4-Jun	155	Tue	Occluded	46
1	24-Apr	114	Wed	Unoccluded	5	5-Jun	156	Wed	Occluded	47
1	25-Apr	115	Thu	Unoccluded	6	6-Jun	157	Thu	Occluded	48
2	26-Apr	116	Fri	Occluded	7	7-Jun	158	Fri	Occluded	49
2	27-Apr	117	Sat	Occluded	8	8-Jun	159	Sat	Occluded	50
2	28-Apr	118	Sun	Occluded	9	9-Jun	160	Sun	Occluded	51
2	29-Apr	119	Mon	Unoccluded	10	10-Jun	161	Mon	Unoccluded	52
2	30-Apr	120	Tue	Unoccluded	11	11-Jun	162	Tue	Unoccluded	53
2	1-May	121	Wed	Unoccluded	12	12-Jun	163	Wed	Unoccluded	54
3	2-May	122	Thu	Unoccluded	13	13-Jun	164	Thu	Occluded	55
3	3-May	123	Fri	Unoccluded	14	14-Jun	165	Fri	Occluded	56
3	4-May	124	Sat	Unoccluded	15	15-Jun	166	Sat	Occluded	57
3	5-May	125	Sun	Occluded	16	16-Jun	167	Sun	Unoccluded	58
3	6-May	126	Mon	Occluded	17	17-Jun	168	Mon	Unoccluded	59
3	7-May	127	Tue	Occluded	18	18-Jun	169	Tue	Unoccluded	60
4	8-May	128	Wed	Occluded	19	19-Jun	170	Wed	Unoccluded	61
4	9-May	129	Thu	Occluded	20	20-Jun	171	Thu	Unoccluded	62
4	10-May	130	Fri	Occluded	21	21-Jun	172	Fri	Unoccluded	63
4	11-May	131	Sat	Unoccluded	22	22-Jun	173	Sat	Occluded	64
4	12-May	132	Sun	Unoccluded	23	23-Jun	174	Sun	Occluded	65
4	13-May	133	Mon	Unoccluded	24	24-Jun	175	Mon	Occluded	66
5	14-May	134	Tue	Occluded	25	25-Jun	176	Tue	Unoccluded	67
5	15-May	135	Wed	Occluded	26	26-Jun	177	Wed	Unoccluded	68
5	16-May	136	Thu	Occluded	27	27-Jun	178	Thu	Unoccluded	69
5	17-May	137	Fri	Unoccluded	28	28-Jun	179	Fri	Occluded	70
5	18-May	138	Sat	Unoccluded	29	29-Jun	180	Sat	Occluded	71
5	19-May	139	Sun	Unoccluded	30	30-Jun	181	Sun	Occluded	72
6	20-May	140	Mon	Unoccluded	31	1-Jul	182	Mon	Unoccluded	73
6	21-May	141	Tue	Unoccluded	32	2-Jul	183	Tue	Unoccluded	74
6	22-May	142	Wed	Unoccluded	33	3-Jul	184	Wed	Unoccluded	75
6	23-May	143	Thu	Occluded	34	4-Jul	185	Thu	Occluded	76
6	24-May	144	Fri	Occluded	35	5-Jul	186	Fri	Occluded	77
6	25-May	145	Sat	Occluded	36	6-Jul	187	Sat	Occluded	78
7	26-May	146	Sun	Unoccluded	37	7-Jul	188	Sun	Unoccluded	79
7	27-May	147	Mon	Unoccluded	38	8-Jul	189	Mon	Unoccluded	80
7	28-May	148	Tue	Unoccluded	39	9-Jul	190	Tue	Unoccluded	81
7	29-May	149	Wed	Occluded	40	10-Jul	191	Wed	Occluded	82
7	30-May	150	Thu	Occluded	41	11-Jul	192	Thu	Occluded	83
7	31-May	151	Fri	Occluded	42	12-Jul	193	Fri	Occluded	84

Equipment will be removed in early August with procedures and outages similar to the installation outages discussed above, if it can be accomplished without manipulating the spill schedule. Equipment removal will be delayed until after the spill season if necessary to prevent interruptions to the other ongoing evaluations.

Additional turbine outages will be needed to install the tracking split-beam system. Units 1-3 likely will need to be turned off for half a day to install this system.

Release hoses will be installed into spill bays 4, 9, and one bay on the south edge of the spill pattern. The southernmost hose will need to move periodically as spill volume changes. This will require closing spill gates during the spill season. To maintain a constant spill percentage during release hose relocation, the amount of spill from the closed bay will be shifted to the remaining open bays until the hose relocation is complete. A control release hose will be installed on the training wall between bays 2 and 3. The District is currently pursuing two alternative designs for this hose. One alternative will involve installing a pipe support in the tailrace, against the stilling basin end sill. This would be diver installed and would require a spillway outage in February. The other alternative would be supported by a jib mounted on the training wall, and would not require special operations.

An underwater antenna array and pressure transducers will be installed in the stilling basin in February. The installation will be accomplished using divers and a small barge mounted crane. This will require a 5-week spillway outage outside of the juvenile fish passage season. The barge crane will be low enough to allow clearance under the avian lines. A one-day outage of the north shore ladder auxiliary water supply system will also be required in February. The ladder entrances will be kept open to facilitate passage, and ladder flow will be reduced to flow through the orifices. The outage is to allow divers to safely work in the immediate area on the underwater antenna array.

The number of spillway and turbine outages will be minimized as much as possible. We will attempt to install all equipment at a given location in one outage. However, this may not always be possible.

2.6. 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 AFEP and with RCC and BPA.

APPENDIX A: JOHN DAY

John Day Dam¹

1. Special Project Operations.

1.1. Spill. Spill will be provided from April 10 through August 31 for spring and summer migrants as required in the NMFS Biological Opinions or as modified to meet test conditions described in paragraph 2. Between May 15 and July 31, spill will occur from 1900 to 0600 hours (11 hours total). Before and after that time period, spill will be for 12 hours nightly, from 1800 to 0600 hours. At project flows up to 300,000 cfs, spill discharges will be 60% of instantaneous project flow. Above 300,000 cfs project flow, spill discharges will be 180,000 cfs (up to the hydraulic limit of the powerhouse). Spill will be provided in a manner consistent with TDG management to avoid excessive gas supersaturation conditions.

2. Studies.

At the time of FPP publication, regional coordination for spill and survival studies at John Day Dam was ongoing. Although the studies described below represent the current proposal, they may be modified upon completion of the regional coordination.

2.1. Project Survival and Fish Passage Efficiency Studies.

Hydroacoustic and radio telemetry techniques will be used to evaluate fish passage and survival at John Day Dam in 2002. Two spill conditions will be compared in response to the BiOp measure to evaluate 12 vs. 24-hour spill effectiveness at John Day Dam. The specific spill levels and duration are outlined in Table SPO-JDA-1. Special operations required to support the survival and FPE studies will be conducted outside of the juvenile fish migration period to the extent practicable. However, there will be some modification to standard project operation. Unit outages for installation of hydroacoustic transducers will be required for approximately 8 days near the end of March. Units 1-16 are scheduled for transducer installation. Typically, 3-unit rolling outages between 0700 and 1700 hrs will be required to allow diver installation of the transducers. Hydroacoustic transducers will also be installed at the spillway.

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Table SPO-JDA-1. Spill treatments for evaluating 12 versus 24-hour spill at John Day Dam in 2002.

Date	% Spill						
10-Apr	0 day/60 night	16-May	0 day/60 night	21-Jun	0 day/60 night	27-Jul	0 day/60 night
11-Apr	0 day/60 night	17-May	0 day/60 night	22-Jun	0 day/60 night	28-Jul	0 day/60 night
12-Apr	30 day/30 night	18-May	30 day/30 night	23-Jun	30 day/30 night	29-Jul	30 day/30 night
13-Apr	30 day/30 night	19-May	30 day/30 night	24-Jun	30 day/30 night	30-Jul	30 day/30 night
14-Apr	30 day/30 night	20-May	30 day/30 night	25-Jun	30 day/30 night	31-Jul	30 day/30 night
15-Apr	30 day/30 night	21-May	30 day/30 night	26-Jun	30 day/30 night	1-Aug	30 day/30 night
16-Apr	0 day/60 night	22-May	0 day/60 night	27-Jun	0 day/60 night	2-Aug	0 day/60 night
17-Apr	0 day/60 night	23-May	0 day/60 night	28-Jun	0 day/60 night	3-Aug	0 day/60 night
18-Apr	0 day/60 night	24-May	0 day/60 night	29-Jun	0 day/60 night	4-Aug	30 day/30 night
19-Apr	0 day/60 night	25-May	0 day/60 night	30-Jun	0 day/60 night	5-Aug	30 day/30 night
20-Apr	30 day/30 night	26-May	30 day/30 night	1-Jul	30 day/30 night	6-Aug	0 day/60 night
21-Apr	30 day/30 night	27-May	30 day/30 night	2-Jul	30 day/30 night	7-Aug	0 day/60 night
22-Apr	0 day/60 night	28-May	30 day/30 night	3-Jul	0 day/60 night	8-Aug	0 day/60 night
23-Apr	0 day/60 night	29-May	30 day/30 night	4-Jul	0 day/60 night	9-Aug	0 day/60 night
24-Apr	30 day/30 night	30-May	0 day/60 night	5-Jul	30 day/30 night	10-Aug	30 day/30 night
25-Apr	30 day/30 night	31-May	0 day/60 night	6-Jul	30 day/30 night	11-Aug	30 day/30 night
26-Apr	30 day/30 night	1-Jun	0 day/60 night	7-Jul	30 day/30 night	12-Aug	30 day/30 night
27-Apr	30 day/30 night	2-Jun	0 day/60 night	8-Jul	30 day/30 night	13-Aug	30 day/30 night
28-Apr	0 day/60 night	3-Jun	30 day/30 night	9-Jul	0 day/60 night	14-Aug	0 day/60 night
29-Apr	0 day/60 night	4-Jun	30 day/30 night	10-Jul	0 day/60 night	15-Aug	0 day/60 night
30-Apr	30 day/30 night	5-Jun	30 day/30 night	11-Jul	0 day/60 night	16-Aug	30 day/30 night
1-May	30 day/30 night	6-Jun	30 day/30 night	12-Jul	0 day/60 night	17-Aug	30 day/30 night
2-May	0 day/60 night	7-Jun	0 day/60 night	13-Jul	30 day/30 night	18-Aug	0 day/60 night
3-May	0 day/60 night	8-Jun	0 day/60 night	14-Jul	30 day/30 night	19-Aug	0 day/60 night
4-May	30 day/30 night	9-Jun	0 day/60 night	15-Jul	0 day/60 night	20-Aug	0 day/60 night
5-May	30 day/30 night	10-Jun	0 day/60 night	16-Jul	0 day/60 night	21-Aug	0 day/60 night
6-May	0 day/60 night	11-Jun	30 day/30 night	17-Jul	30 day/30 night	22-Aug	30 day/30 night
7-May	0 day/60 night	12-Jun	30 day/30 night	18-Jul	30 day/30 night	23-Aug	30 day/30 night
8-May	0 day/60 night	13-Jun	30 day/30 night	19-Jul	30 day/30 night	24-Aug	30 day/30 night
9-May	0 day/60 night	14-Jun	30 day/30 night	20-Jul	30 day/30 night	25-Aug	30 day/30 night
10-May	30 day/30 night	15-Jun	0 day/60 night	21-Jul	0 day/60 night	26-Aug	0 day/60 night
11-May	30 day/30 night	16-Jun	0 day/60 night	22-Jul	0 day/60 night	27-Aug	0 day/60 night
12-May	30 day/30 night	17-Jun	30 day/30 night	23-Jul	0 day/60 night	28-Aug	30 day/30 night
13-May	30 day/30 night	18-Jun	30 day/30 night	24-Jul	0 day/60 night	29-Aug	30 day/30 night
14-May	0 day/60 night	19-Jun	0 day/60 night	25-Jul	30 day/30 night	30-Aug	0 day/60 night
15-May	0 day/60 night	20-Jun	0 day/60 night	26-Jul	30 day/30 night	31-Aug	0 day/60 night

Approximately 1 week will be required for the spillway installation to occur prior to the spill season (mid-March). Spillbays 2-20 are scheduled for transducer installation. Additional unit and/or spillbay outages (up to 14) may be required throughout the study period to replace damaged transducers. Unit outages would likely consist of a 3-unit, 4-hour outage for each transducer replacement/repair. Spillbay outages would likely require a single-bay, 4-hour outage for each replacement/repair. Single unit outages may be required after April 15 to complete installation of underwater radio telemetry antennas on the STSs. These outages (approximately 8 hours each) would require unit shutdown, pulling the STS, installing antenna, then replacing STS for operation. Fish release hoses will be installed in 2 spillbays (3 and 12) prior to the juvenile fish passage season. Juvenile salmonids will be captured and held at the John Day Dam smolt monitoring facility for radio tagging.

Boat access to the tailrace BRZ will be required during the study to mobile track radio-tagged fish. Radio telemetry and hydroacoustic evaluations will occur from April 15 through July 31 with a one-week break about the first week of June. After the study concludes, additional, 3-unit rolling outages for the removal of hydroacoustic transducers will be required for approximately 1 week in August. Spillway transducers will be removed after the juvenile fish passage season and take about 1 week.

2.2. Modified Extended Length Bar Screen Evaluations (ESBS).

In 2002, ESBS evaluations will focus on fish guidance efficiency (FGE), orifice passage efficiency (OPE), and the effects of the ESBS on fry impingement, smolt condition, and juvenile lamprey impingement. Currently, the ESBS/VBS/FCD is scheduled for delivery to the Project on March 15, 2002. It is anticipated that after delivery, the Project will need approximately 1 week to deploy and test the system. After initial system testing by Project staff, preliminary injury/mortality tests will be conducted prior to the juvenile salmonid migration and FGE evaluation (prior to April 17). Fyke net sampling and gatewell dip-netting to evaluate FGE will occur from April 17 through July 31. FGE will be estimated in slot B of main unit 7 nightly throughout the study. Each nightly test will last a minimum of 1 hour and typically begin at 2000 h and end between 2100 and 2300 h (specific schedule to be determined later). Unit outages during the evaluation will be frequent and of varying duration, but will likely occur during the late evening and early morning hours. Periodic, short outages may be required during the day to pull the screens for inspection. OPE tests will also be conducted in unit 7 by releasing PIT-tagged individuals into the test gatewell then monitoring passage time to the smolt monitoring facility. PIT-tagged fish will be captured at the smolt monitoring facility and examined for injury/mortality. Additionally, juvenile lamprey impingement on the ESBS will be monitored with underwater video cameras mounted on the ESBS trash sweep. During the ESBS evaluation, special operation of units 6, 7, and 8 will be required to insure optimum test flow conditions around the test unit.

2.3. Surface Flow Bypass Evaluation.

3-D acoustic telemetry techniques will be used to assess juvenile salmonid behavior in the spillway tailrace at John Day Dam. Acoustic hydrophones will be deployed on clump anchors with a crane barge in the spillway tailrace. Hydrophone deployment will occur prior to the spill season. Juvenile salmonids (~100) will be collected from the smolt monitoring facility, tagged, and released through spillbays (yet to be determined) between

April 15 and June 1. Hydrophones will be removed from the spillway tailrace after the spill and juvenile passage season.

2.4. Adult Salmon and Steelhead Passage Evaluations. Radio telemetry techniques will be used to evaluate adult salmon and steelhead passage through the project. Adult salmon and steelhead fallback rates will be evaluated during spill for juvenile passage studies. The specific spill levels and duration for these studies follow. Fallback into the juvenile bypass system and passage through a modified section of the south ladder will be assessed. Downstream migration of post-spawn steelhead (kelts) will be evaluated using radio telemetry at John Day Dam. As part of this evaluation, adult steelhead passing through the juvenile bypass system will be diverted to the adult holding tank, identified as pre or post-spawn, and enumerated. Steelhead identified as kelts will be tagged with radio transmitters and released back to the river (318 at John Day and 318 at McNary). To evaluate returns of transported and river run kelts, an additional 1000 will be PIT tagged. Half will be transported below Bonneville Dam and released and half will be returned to the river.

2.5. 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 AFEP and with RCC and BPA.

APPENDIX A: MCNARY

McNary Dam¹

1. Special Project Operations.

1.1. Spill. Spill for fish passage will be provided during the spring outmigration season, in accordance with spill specifications in the NMFS BiOp (Appendix E) as updated in 2002 through the TMT Water Management Plan. Special daytime or nighttime spill patterns may be implemented to control dissolved gas levels to agreed upon levels, while attempting to achieve desired spillway discharges. Alternative spill patterns to reduce TDG levels or to change tailrace conditions for fish passage should be coordinated through the TMT.

1.2. New spill patterns. Additional spillway deflectors for bays 1, 2, 21, and 22 were constructed during the winter of 2001-02. As a result, new spill patterns will be implemented in 2002. The new patterns have not yet been determined, pending modeling studies at the Waterways Experiment Station and regional coordination. It is anticipated that the new spill patterns will be finalized prior to the 2002 spill season and will be incorporated into the Fish Passage Plan by amendment at that time.

1.3. Doble Tests. Transformer banks 1 and 7 will be taken out of service, one at a time, and Doble tested in September 2002. The two corresponding turbine units (1 and 2, and 13 and 14) for each transformer bank will be out of service during the testing. Testing will take approximately 3 days per transformer bank.

1.4. Installation of Adult PIT Tag Detectors. Ladder orifice PIT tag detection systems will be installed in both ladders, requiring extended ladder outages. The Washington ladder will be dewatered on 2 January 2002 and watered up on 31 January 2002. The Oregon ladder will be dewatered on 1 February 2002 and watered up on 8 March 2002. This is a very tight schedule for the amount of work to be completed in the ladder. In the event that the Oregon ladder cannot be returned to service on 7 March, limited attraction spill will be provided on the Washington side of the fishway. The discharge and pattern used are yet to be determined.

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.

2. Studies.

2.1. Near-field Study of Total Dissolved Gas Exchange and Evaluation of Added Spillway Deflector Performance. As part of the COE Fastrack Gas Abatement Program at McNary Dam, total dissolved gas abatement alternatives are being developed to reduce the TDG exchange associated with spill operations and to provide greater flexibility in scheduling spillway operations. Additional spillway deflectors for bays 1, 2, 21, and 22 were constructed during the winter of 2001-02. There is a need to determine the TDG exchange performance of both the old and new deflectors under a wide range of operating conditions, and thus determine the benefits associated with the modified spillway. A field study is proposed for the first two weeks of April. Spillway and powerhouse discharge will be systematically varied, and standard and special spill patterns will be investigated.

2.2. Turbine Survival Testing. Turbine survival testing is scheduled to take place at McNary Dam in spring 2002. Unit 7 will be the test unit. Balloon tag testing will take place for approximately three weeks in early and mid April. During this time, unit 7 will occasionally be operated at two different power levels during daylight hours. The upper power level operation will be outside of the 1% band of peak efficiency. Timing of this test will be as early in the season as possible in order to subject as few fish as possible to turbine passage outside of the 1% band of peak efficiency. Balloon-tagged fish will be released through pipes upstream of the turbine and in the tailrace (control release). Depending on test results, additional testing with radio-tagged fish may take place in late April and into May.

2.3. Evaluation of Juvenile Fish Transportation Versus In-River Survival. The Juvenile Fish Transportation Program will be evaluated at McNary in 2002. Juvenile spring chinook which were PIT tagged at upstream hatcheries will either be placed into barges or returned to the river. The PIT tag gates will be programmed to determine which route these tagged fish will be sent.

2.4. Tailrace Egress. There is concern regarding juvenile egress and ladder entrance conditions resulting from construction of the end bay spill deflectors. In order to assess how juvenile salmon react to the eddy formed on the north shore approximately 100 radio-tagged yearling chinook will be released in front of spillbay 1 in April. The study will occur immediately after voluntary fish spill begins around 10 April, or will occur in conjunction with the near field dissolved gas studies discussed above.

2.5. Evaluation of Adult Salmon and Steelhead Migration Past the Snake and Columbia River Dams. Idaho Cooperative Fisheries Research Unit will monitor the passage of adult salmonids through the hydrosystem. This study will determine passage effectiveness with the newly completed spillway deflectors and training wall. Holding of adult fallbacks within the juvenile collection channel will also be evaluated. The study requires the installation of radio receivers and data loggers throughout the fishways and various locations on the dam. The installation of equipment will take place prior to the fish season and is not anticipated to require special project operations.

2.6. Ice Harbor Spillway Survival Study. Radio-tagged chinook salmon will be used to determine spillway survival at Ice Harbor Dam. Monitoring of these fish will continue at McNary Dam. Radio antennas will be mounted in pier nose pipes installed last year, and antennas will be attached to all ESBSs prior to deployment as last year. No special operations are anticipated for this study.

2.7. Prototype Testing of a Cylindrical Dewatering Screen. A prototype cylindrical dewatering structure was constructed on the tailrace deck adjacent to turbine unit 14 in 2000. National Marine Fisheries Service and the Corps will evaluate the biological and debris handling performance of the new prototype. Fish for test purposes will be obtained by gatewell dipping. Debris used for the evaluation may be collected from the raceways at the juvenile fish facility, from the vertical barrier screens during periodic cleaning, or from the forebay.

APPENDIX A: ICE HARBOR

Ice Harbor Dam¹

1. Special Project Operations.

1.1. Spill. Spill for fish passage will be provided during spring and summer outmigration seasons, in accordance with spill specifications in the NMFS BiOp (Appendix E) as updated in 2002 through the TMT Water Management Plan. Special daytime and nighttime spill patterns may be implemented to control dissolved gas levels to agreed upon levels or to reduce tailrace eddy conditions, while attempting to achieve desired spillway discharges. Alternative spill patterns to reduce TDG levels or to change tailrace conditions for fish passage should be coordinated through the TMT.

1.2. Spillway Tainter Gate Inspection. A Contractor will inspect the spillway tainter gates during the July-September timeframe. Each gate will be taken out of service, one at a time, and inspected. A clearance tag will be issued and stop logs installed to unwater each gate for inspection.

1.3. Doble Tests. To complete Doble testing, line 2 and turbine units 3 and 4 will be taken out of service in July 2002. Line 1 and turbine units 1 and 2 will be taken out of service in October 2002. Testing will take approximately 3 days per line.

1.4. Emergency Auxiliary Water Supply. In order to provide redundancy in the auxiliary water supplies that will ensure that ladder operation criteria can be met in the event of pump, electrical system, or other failure a major system upgrade is underway. The AWS pumps for the south ladder will be out of service all of January and February 2002 to complete electrical upgrades, while the ladder itself will be out of service 14-24 January. The north ladder and its AWS pumps will also be out of service 4-14 February for annual inspection and maintenance. In December 2002 the north ladder will be taken out of service until 28 February 2003 to install new AWS pumps.

2. Studies.

2.1. Spillway Survival Study. NMFS will estimate the survival rate of radio tagged and PIT tagged fish passing over the spillway relative to those released just downstream. Project operations will be according to the BiOp spill recommendations.

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However, in order to know the tailrace hydraulic conditions each release group experienced we are requesting that no changes in discharge of any spillbay or turbine be made in the hour before and after each release. Releases will be made at noon and midnight for approximately 20 days beginning 1 May 2002.

2.2. Evaluation of Adult Salmon and Steelhead Migration Past the Snake and Columbia River Dams. Idaho Cooperative Fisheries Research Unit will monitor the passage of adult salmonids through the hydrosystem. This study will determine passage effectiveness with the newly completed spillway deflectors and training wall. Holding of adult fallbacks within the juvenile collection channel will also be evaluated. The study requires the installation of radio receivers and data loggers throughout the fishways and various locations on the dam. The installation of equipment will take place prior to the fish season and is not anticipated to require special project operations.

2.3. Adult Fishway Evaluation. The Walla Walla District will evaluate operational characteristics of the adult fishways in 2002. The purpose is to analyze existing operating conditions and investigate alternatives to improve fish passage, especially during times of low tailwater. This will involve adjusting diffuser gates and entrance weirs. Efforts will be made to stay within criteria, although occasional deviations will likely occur. A final report will be completed in September 2002.

APPENDIX A: LOWER MONUMENTAL

Lower Monumental Dam¹

1. Special Project Operations.

1.1. Spill. Voluntary spill for fish passage cannot be provided at Lower Monumental Dam in 2002. Erosion damage to the stilling basin has occurred and is scheduled for repair (see 1.2 below). If involuntary spill occurs, however, spill discharges and patterns would be shaped, to the extent possible, according to specifications in the NMFS BiOp (Appendix E) as updated in 2002 through the TMT Water Management Plan. Special nighttime spill patterns may be implemented to control dissolved gas levels to agreed upon levels, while attempting to achieve desired spillway discharges. Alternative spill patterns to reduce TDG levels or to change tailrace conditions for fish passage should be coordinated through the TMT. Nighttime spill levels may be reduced or curtailed for short periods of time on a daily or every other day basis in order to provide safe conditions for the towboat and fish barge to travel to and from the juvenile fish facilities and for loading the fish barge. Depending on flow levels, Lower Monumental pool may also need to be manipulated above MOP in order to control spill while the fish barge is loading.

General hydraulic model studies are being performed at Waterways Experimental Station. The results of these studies may lead to a request to alter the spill pattern to reduce stilling basin erosion damage.

1.2 Repair of Spillway Stilling Basin and Installation of Additional Spillway Deflectors. Significant erosion damage has occurred in the spillway stilling basin and repairs are scheduled for 2002. The general timeframe for in-water work is May through October. Personnel will work from several barges, drilling holes and installing anchors followed by concrete placement. Work that creates noise will be suspended during certain hours of the day to minimize adverse effects on adult fish passage. In addition, new spillway deflectors will be installed in bays 1 and 8, and the existing deflector in bay 2 will be repaired, from October 2002 to February 2003.

1.3. Index Testing. Index testing of turbine units will take place in late 2001 and early 2002. Turbine unit 2 will be done first, then turbine unit 6. The purpose of index testing is to

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determine turbine unit performance so that the unit can be operated at peak efficiency.

2. Studies.

2.1. Evaluation of Adult Salmon and Steelhead Migration Past the Snake and Columbia River Dams. Idaho Cooperative Fisheries Research Unit will continue to monitor the passage of adult salmonids through the hydrosystem. The 5 floating orifices (1,3, 5, 7, and 9 numbered from north to south) will again be closed for the 2002 fish passage season. This will be the second year of this study. Installation of radio receivers and data loggers throughout the fishway and various locations on the dam will be required. The installation of equipment will take place prior to the fish passage season and is not anticipated to require special project operations. During repair of the spillway stilling basin mentioned above, especially when drilling occurs, adult fish passage delay will be closely monitored.

2.2. Ice Harbor Spillway Survival Study. Juvenile fish will be removed from the Lower Monumental Dam daily sample and tagged with radio tags and PIT tags for a spillway survival study at Ice Harbor Dam.

2.3. Adult Fishway Evaluation. The Walla Walla District will evaluate operational characteristics of the adult fishways in 2002. The purpose is to analyze existing operating conditions and investigate alternatives to improve fish passage, especially during times of low tailwater. This will involve adjusting diffuser gates and entrance weirs. Efforts will be made to stay within criteria, although occasional deviations will likely occur. A final report will be completed in September 2002.

2.4. Evaluation of Juvenile Fish Transportation Versus In-River Survival. The Juvenile Fish Transportation Program will be evaluated at Lower Monumental in 2002. A tentative study plan involves alternately transporting and bypassing fish during the spring. Details of the study are yet to be determined.

APPENDIX A: LITTLE GOOSE

Little Goose Dam¹

1. Special Project Operations.

1.1. Spill. Spill for fish passage will be provided during the spring outmigration season when seasonal average flows are projected to be 85 kcfs or higher, according to specifications in the NMFS BiOp (Appendix E) as updated in 2002 through the TMT Water Management Plan. Special nighttime spill patterns may be implemented to control dissolved gas levels to agreed upon levels, while attempting to achieve desired spillway discharges. Alternative spill patterns to reduce TDG levels or to change tailrace conditions for fish passage should be coordinated through the TMT.

1.2. Doble Tests. The transformers will be taken out of service for Doble testing in August 2002. All turbine units will be out of service at the same time for part of the Doble testing. During this time, turbine unit 5 will be operated at speed, no load, to supply station power. Testing will take approximately 10 hours per day for 4 days. During non-testing hours, normal project operation will occur.

1.3. Index Testing. Index testing of turbine units will take place in late 2002 and early 2003. Two turbine units will be tested, one at a time. The purpose of index testing is to determine turbine unit performance so that the unit can be operated at peak efficiency.

2. Studies.

2.1. Evaluation of Adult Salmon and Steelhead Migration Past the Snake and Columbia River Dams. Idaho Cooperative Fisheries Research Unit will continue to monitor the passage of adult salmonids through the hydrosystem. The 4 floating orifices (1, 4, 6, and 10 numbered from south to north end) are closed for the second year of this study. Installation of radio receivers and data loggers throughout the fishway and various locations on the dam will be required. The installation of equipment will take place prior to the fish season and are not anticipated to require special project operations.

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2.2. Juvenile Fish Facility PIT Diversion Modifications. During the 2001-02 winter maintenance period the PIT tag diversion system downstream of the drop gates will be modified, including a new dewaterer, new three-way gate, and new pipe to the outfall. As soon as the facility is operating in the spring NMFS will be conducting an evaluation of the new system. Fish will be released at various points in the system. Effects on facility operation will be minimal. However, operation of the 3-way gate may be limited by this study for a short period of time. This will be coordinated through appropriate groups. Additionally, the survival of PIT diverted fish will be compared to primary bypass. The JFF will be put into primary bypass 18 times for 15 minutes each time for fish releases. Nine releases will be at night and nine in the daytime.

2.3. Adult Fishway Evaluation. The Walla Walla District will evaluate operational characteristics of the adult fishway in 2002. The purpose is to analyze existing operating conditions and investigate alternatives to improve fish passage, especially during times of low tailwater. This will involve adjusting diffuser gates and entrance weirs. Efforts will be made to stay within criteria, although occasional deviations will likely occur. A final report will be completed in September 2002.

APPENDIX A: LOWER GRANITE

Lower Granite Dam¹

1. Special Project Operations.

1.1. Spill. Spill for fish passage will be provided during the spring outmigration season when seasonal average flows are projected to be 85 kcfs or higher, according to specifications in the NMFS BiOp (Appendix E) as updated in 2002 through the TMT Water Management Plan. Special nighttime spill patterns may be implemented to control dissolved gas levels to agreed upon levels, while attempting to achieve desired spillway discharges. Alternative spill patterns to reduce TDG levels or to change tailrace conditions for fish passage should be coordinated through the TMT. 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 facilities below the dam.

1.2. Repair of Turbine Unit 4. Turbine unit 4 has a hydraulic problem associated with operation of the turbine blades. It will be out of service for repair for about three months, essentially most of the summer.

1.3. Emergency Auxiliary Water Supply. Pump #1 will be taken out of service about 1 December 2002 for replacement of the speed reducer. Therefore, it will not be available for backup if either pump #2 or #3 fail. All three AWS pumps will be unavailable during January and February 2003.

2. Studies.

2.1. Evaluation of Adult Salmon and Steelhead Migration Past the Snake and Columbia River Dams. Idaho Cooperative Fisheries Research Unit will continue to monitor the passage of adult salmonids through the hydrosystem. The study requires the installation of radio receivers and data loggers throughout the fishway and various locations on the dam. The installation of equipment will take place prior to the fish season and is not anticipated to require special project operations.

2.2. Ladder Transition Pool Test. In order to test the effects of the transition pool modifications the vertical stoplogs will be periodically raised and lowered. With the stoplogs raised

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there is no head across the weirs and very little flow through the orifices. When the stoplogs are lowered head forms across the weirs, forcing moderate velocities through the orifices. Each experimental block will consist of 20 radio tagged fish: 10 passing with the stoplogs raised and 10 with the stoplogs down. The starting position will be randomly selected for each block. Therefore, sometimes 20 radio tagged fish will pass before a change is made and sometimes 10 fish. At the peak of the run a change may be needed every couple days; however, at other times it may be two weeks between changes. All changes are made at least two hours after dark and require no change in ladder operations.

2.3 Removable Spillway Weir Operation. The Removable Spillway Weir (RSW) was installed in the summer of 2001. It will undergo biological testing in spring 2002. The expected forebay elevation during testing will be between 734 and 735 feet, providing approximately 6,700 to 7,700 cfs over the RSW. It is expected that there will be three different spill operations during the testing period. Monitoring will consist of hydroacoustics, radiotelemetry and three-dimensional acoustic tag tracking. Monitoring will focus on RSW efficiency and effectiveness, and fish behavior in the vicinity of the RSW.

2.4. Evaluation of Juvenile Fish Physiological Changes. PIT-tagged juvenile spring/summer/fall chinook will be sampled at the juvenile fish facility and taken to a laboratory for an examination of the physiological changes they experienced after release from the hatchery of origin. This will require scientists to have access to the facility and to use the PIT tag sort-by-code system.

2.5. Evaluation of the Delayed Mortality of Juvenile Fish Following Transportation. PIT-tagged juvenile spring chinook will be sampled at the juvenile fish facility and differentially barged to Bonneville Dam. This will require scientists to have access to the facility and to use the PIT tag sort-by-code system. In addition, PIT-tagged fish will be held either within a barge hold in a separate container or in a tank on deck and barged to Bonneville Dam where they will be taken to a salt water rearing facility for physiological testing.

2.6. Evaluation of Juvenile Fish Transportation Versus In-River Survival. Juvenile spring/summer chinook and steelhead will be PIT tagged at the juvenile fish facility and then released into the river below the project for either in-river migration or collection and transportation at Little Goose Dam. Most fish will be tagged out of the east bank of raceways in NMFS's temporary tagging facilities. Tagging of fish from the raceways

will be independent of any other facility sampling operations and will reduce the number of fish direct loaded into fish barges. At the beginning and end of the tagging operation, when fish numbers are low, fish may be tagged in the facility sampling room. This will require an increase in the normal facility sampling rate in order to get the required number of fish on marking days. The adult fish trap will also be operated in 2002 to monitor adult returns of study fish tagged in previous years.

2.7. Adult Fishway Evaluation. The Walla Walla District will evaluate operational characteristics of the adult fishway in 2002. The purpose is to analyze existing operating conditions and investigate alternatives to improve fish passage, especially during times of low tailwater. This will involve adjusting diffuser gates and entrance weirs. Efforts will be made to stay within criteria, although occasional deviations will likely occur. A final report will be completed in September 2002.