



# FISH PASSAGE CENTER

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## MEMORANDUM

TO: Rick Kruger (ODFW)

FROM: Michele DeHart

DATE: March 27, 2009

RE: Reduction in spring spill at FCRPS Projects under the Draft 2009 Fish Operations Plan, compared to 2008 Fish Operations Plan

In response to your request, the Fish Passage Center has reviewed the Draft 2009 Fish Operations Plan (2009 FOP) and modeled spring spill volumes to determine how much of a reduction in spring spill would occur under the 2009 FOP, when compared to the 2008 Fish Operations Plan (2008 FOP). This comparison only includes spring passage periods, because that is all that is included in the present 2009 FOP. The NOAA Biological Opinion includes significant reductions in spill for fish passage in the summer period, which are not addressed in this memorandum or in the present 2009 FOP.

In addition, the 2009 FOP includes potential actions that could significantly reduce spill for fish passage. Specifically turbine unit testing around maintenance outages is discussed in general terms, specific schedules are not included. The FOP includes provisions to test turbines during the juvenile fish migration period for up to 30 minutes. This turbine testing will be conducted utilizing water volume that would otherwise be provided as spill. The fisheries managers have recommended against this procedure, and have recommended that turbine maintenance be conducted outside of the fish passage period. Turbine testing during low flow periods could represent a significant reduction in spill during the testing period. Below is a brief synopsis of our findings, followed by a more detailed explanation of the methods and results.

Under the 2009 FOP spring spill volume is reduced at Little Goose (LGS), Ice Harbor (IHR), McNary (MCN), and John Day (JDA) dams. The largest reductions in spring spill

volume would occur at LGS, which would see a 5.5% reduction in spring spill volume under the 2009 FOP. Reductions in spring spill volume at IHR, MCN, and JDA were smaller ( $\leq 2.0\%$ ).

The Fish Passage Center estimated total spring spill volume at all eight FCRPS projects under the 2009 FOP and 2007 FOP. This was done for the 2008 water year.

The total volume of spill provided at each project was estimated assuming voluntary spill was to be managed to the 115/120% criteria. Under both FOPs, we estimated hourly spill volumes after accounting for excess generation spill. If the operation called for a set volume of spill then that volume was provided, unless flows were sufficiently high to warrant forced spill due to excess hydraulic capacity. If the planned operation called for a percent of the total flow then that percent of the hourly flow was provided as spill. In this case, if the necessary percent spill was greater than the estimated spill cap (Table 1), spill during these times was capped at the spill cap, unless flows were sufficiently high to warrant forced spill due to excess hydraulic capacity. Finally, if the planned operation called for gas cap spill then spill to the estimated spill cap (Table 1) was provided, unless flows were sufficiently high to warrant forced spill.

**Table 1.** Summary of operations specified in 2009 FOP and 2009 FOP, and assumptions used for modeling total spring spill volume for FCRPS projects. Assumptions listed were used for both the 2009 FOP and 2008 FOP.

Project	Spring Spill Period	2009 FOP Spring Spill Operation	2008 FOP Spring Spill Operation	Assumed Hyd. Cap. (Kcfs)	Assumed Spill Cap (Kcfs)	Assumed PH Min. (Kcfs)
LGR	4/3 – 6/20	20 Kcfs/20 Kcfs	20 Kcfs/20 Kcfs	130	N/A*	11.5
LGS	4/3 – 6/20	30%/30%	30%/30% (14 days of 30%/GC spill from 4/25-5/9)	130	30 Kcfs; Used actual 2008 spill caps for period of GC spill	11.5
LMN	4/3 – 6/20	GC/GC	GC/GC	130	Actual spill caps from 2008	11.5
IHR	4/3 – 6/20	45 Kcfs/GC (4/3-4/15); 45 Kcfs/GC vs. 30%/30% (4/15-6/8); 45 Kcfs/GC (6/8-6/20)	45 Kcfs/GC (4/3-5/2); 45 Kcfs/GC vs. 30%/30% (5/2-6/20)	94	Actual spill caps from 2008	9.5
MCN	4/10 – 6/30	40%/40% (4/10-6/30)	40%/40% (4/10-6/21); 40%/40% vs. 60%/60% (6/21-6/30)	232	161.1	50
JDA	4/10 – 6/30	30%/30% (4/10-4/21); 30%/30% vs. 40%/40% (4/21-6/30)	0 Kcfs/GC (4/10-4/21); 30%/30% vs. 40%/40% (4/21-6/30)	322	131	50

TDA	4/10 – 6/30	<b>40%/40%</b>	<b>40%/40%</b>	375	122.17	50
BON	4/10 – 6/30	<b>100 Kcfs/100 Kcfs (4/10-6/21); 85 Kcfs/GC (6/21-6/30)</b>	<b>100 Kcfs/100 Kcfs (4/10-6/21); 85 Kcfs/GC (6/21-6/30)</b>	288	113.27 Kcfs (4/10-6/21); Actual 2008 spill caps (6/21-6/30)	30

\* Operations call for spill volumes much less than estimated spill cap at LGR, therefore an assumed spill cap is unnecessary.

Under the 2009 FOP, spring spill volumes at LGS would be decreased by approximately 5.5% when compared to the 2008 FOP (Table 2). This reduction in spring spill at LGS is due to the 2009 FOP eliminating the 14 days of 30%/Gas Cap spill that was provided at LGS under the 2008 FOP.

At IHR, the 2009 FOP would reduce spring spill volumes by 2.0% when compared to the 2008 FOP (Table 2). This reduction is due to a change in the “testing period” under the 2009 FOP, which extends the period of time that the lower 30%/30% spill operation is provided at IHR. In the 2009 FOP, spill is to be 45 Kcfs/Gas Cap from April 3 until the beginning of the testing, which is anticipated for mid-April (FPC assumed April 15). Once testing begins, the operation at IHR will alternate between 45 Kcfs/Gas Cap and 30%/30% in 2-day blocks. This “testing period” is anticipated to last until early June (FPC assumed June 8). However, under the 2008 FOP, the 45 Kcfs/Gas Cap operation was provided from April 3 to May 2, at which time spill operations alternated between 45 Kcfs/Gas Cap and 30%/30% in 2-day blocks until the end of spring spill.

At MCN, the 2009 FOP would reduce spring spill volumes by 1.7% when compared to the 2008 FOP (Table 2). However, this is dependent on summer operations under the 2009 FOP. Under the 2008 FOP, the summer spill test of 40%/40% vs. 60%/60% began on June 21 at MCN. However, there is no mention of this test in the 2009 FOP. Therefore, under the 2009 FOP the FPC modeled 40%/40% spill for the entire spring period (Apr. 10-June 30). If a test of 40%/40% vs. 60%/60% is to be provided in 2009, beginning on April 21, there will be no reduction in spring spill volumes at MCN under the 2009 FOP.

At JDA, the 2009 FOP would reduce spring spill volumes by 0.3% when compared to the 2008 FOP (Table 2). This reduction is due to a change in the operation at JDA prior to the “testing period”. Under both FOPs, spring spill will alternate between 30%/30% and 40%/40% in 2-day blocks. However, under the 2008 FOP, the period prior to these tests (4/10-4/21) had an operation of 0 Kcfs/60% spill. Under the 2009 FOP, this operation will be 30%/30%. The difference in spill volumes due to these changes in operations is small.

Spring spill volumes at LGR, LMN, TDA, and BON are not expected to be reduced under the 2009 FOP.

**Table 2.** Estimated spring spill volumes under 2008 FOP and 2009 FOP and the estimated percent decrease in total spring spill if operating under the 2009 FOP.

<b>Project</b>	<b>2008 FOP Estimated Spring Spill Volume (KAF)</b>	<b>2009 FOP Estimated Spring Spill Volume (KAF)</b>	<b>Percent Decrease</b>
LGR	3,134	3,134	0.0
LGS	3,954	3,736	5.5
LMN	4,005	4,005	0.0
IHR	7,284	7,141	2.0
MCN	18,997	18,667	1.7
JDA	15,255	15,205	0.3
TDA	16,170	16,170	0.0
BON	16,016	16,016	0.0