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MEMORANDUM

TO: Rick Kruger (ODFW)

FROM: Michele DeHart

DATE: March 5, 2009

RE: Reduction in spring spill at Lower Granite, Little Goose, and Lower Monumental dams due to later spring spill start date and earlier initiation of summer spill volumes under the 2008 Biological Opinion

In response to your request, the Fish Passage Center has reviewed the 2008 Biological Opinion (2008 BiOp) and modeled spring spill volumes to determine how much of a reduction in spring spill would occur under the 2008 BiOp. Below is a brief synopsis of our findings, followed by a more detailed explanation of the methods and results.

- Under the 2008 BiOp spring spill in 2006 and 2007 (April 3-June 20) would have been reduced by 1.87% at LGR, 1.73-1.93% at LGS, and 8.16-8.64% at LMN.

The Fish Passage Center estimated total spill volume from April 3 to June 20 at LGR, LGS, and LMN under each of two scenarios: 1) Actual Spill Volumes and 2) Spill Under the 2008 BiOp. This was done for two water years (2006 and 2007). Water year 2006 is intended to represent what would happen in a high water year and 2007 is intended to represent what would happen in a lower 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 the Actual Spill Volume scenario, we used actual average daily operations after accounting for excess generation spill. Under the 2008 BiOp scenario, 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 daily flow was provided as spill. In this case, if the necessary percent spill was greater then 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 2008 Draft BiOp and assumptions used for modeling total spill volume from April 3 to June 20 at LGR, LGS, and LMN.

Project	Initiation of Spring Spill	Spring Spill Operation	Summer Spill Operation	Assumed Hydraulic Capacity (Kcfs)	Assumed Spill Cap (Kcfs)	Assumed Powerhouse Minimum (Kcfs)
LGR	Apr. 3	20 Kcfs (24-hours)	18 Kcfs (24-hours)	130	N/A*	11.5
LGS	Apr. 5	30% (24-hours)	30% (24-hours)	130	30	11.5
LMN	Apr. 7	Gas Cap (24-hours)	17 Kcfs (24-hours)	130	27	11.5

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

Under the 2008 BiOp, spring spill would begin at LGR on April 3, LGS on April 5, and LMN on April 7. This is different from the actual operations in 2006 and 2007, where spill began on April 3rd at all three sites. Furthermore, under the 2008 BiOp, the initiation of summer spill depends on collections of subyearling Chinook and is variable by year. In 2006 and 2007, the initiation of summer spill operations was static, beginning on June 21st. Both of these differences had an impact on spring spill volumes, given that spring spill is beginning later at LGS and LMN and that summer spill volumes are typically lower than spring spill volumes, with exception to LGS.

For both years modeled, the 2008 BiOp resulted in a 1.87% decrease in the total volume spilled at LGR from April 3 to June 20, for both years modeled. This reduction in spill is from the lower summer spill volume at LGR being initiated about three weeks earlier than usual (Table 2). At LGS there is no difference in operations between the 2008 BiOp and what has been done in the past, except that spill starts 2 days later under the 2008 BiOp. This later initiation of spring spill resulted in a 1.73-1.93% reduction in the total spill volume from April 3 to June 20 (Table 2). Finally, the change in spring spill schedule had the largest impact at LMN. Because spill starts 4 days later under the 2008 BiOp and the lower summer spill volume began 2-3 weeks earlier than usual, the reduction in spill at LMN ranged from 8.16% in 2007 to 8.64% in 2006 (Table 2).

Table 2. Estimated spill volumes under Actual Operations and the 2008 BiOp from April 3 to June 20. Under the 2008 BiOp, summer spill volumes would begin earlier, based on collections of subyearling Chinook.

		Actual Spill Volume		2008 BiOp		
Site	Water Year	Spring Spill Period	Spring Spill Volume (KAF)	Spring Spill Period	Spring Spill Volume (KAF)	Percent Decrease
LGR	2006	4/3-6/20	3,600	4/3-6/3 Summer Volumes (6/4-6/20)	3,532	1.87
	2007	4/3-6/20	3,113	4/3-6/4 Summer Volumes (6/5-6/20)	3,054	1.87
LGS	2006	4/3-6/20	4,803	4/5-6/3 Summer Volumes (6/4-6/20)	4,710	1.93
	2007	4/3-6/20	2,747	4/5-6/8 Summer Volumes (6/9-6/20)	2,699	1.73
LMN	2006	4/3-6/20	4,118	4/7-6/3 Summer Volumes (6/4-6/20)	3,763	8.64
	2007	4/3-6/20	3,457	4/7-6/9 Summer Volumes (6/10-6/20)	3,175	8.16