FPP Change Request Form

Change Form # & Title:	16LWG005 – Low Flow Spill Patterns w/ No RSW
Date Submitted:	January 28, 2016
Project:	LWG
Requester Name, Agency:	Corps NWW
Final Action:	**APPROVED – January 28, 2016**

FPP Section: LWG 2.3.3.6. RSW Operating Criteria; and Table LWG-9.

Justification: The Lower Granite RSW in Bay 1 spills a fixed rate of ~6.8 kcfs. As a result, the RSW must be closed when total spill is less than ~6.8 kcfs (i.e., during low flows). Low flow spill patterns were modeled at ERDC in October 2015. Based on the results, the recommendation is to close the RSW when total project outflow drops below 30 kcfs and go to the new low flow spill patterns with no RSW defined in Table LWG-9.

This change form adds new criteria to section 2.3.3.7 to close the RSW at total project outflow below 30 kcfs, adds new patterns to Table LWG-9 for spill with No RSW, and adds a footnote to the other spill pattern tables to include this new criteria.

Proposed Changes:

2.3.3.6. Removable Spillway Weir (RSW).

i. The RSW in spillbay 1 will be in the raised position and operational on the first day of spill for juvenile fish passage.

ii. When the RSW is in operation, spill through Bay 1 is fixed at approximately 6.8 kcfs. ~~t~~The spillgate shall be raised to where it does not touch flow passing down the RSW (at least nine stops).

iii. When the National Weather Service forecasts Lower Granite inflows to exceed 200 kcfs, initiate aggressive forebay debris removal so that RSW operation will not be impeded and coordinate with RCC and CENWW-OD-T.

iv. Complete RSW stow (complete rotation to the landing pad) when inflow exceeds 260 kcfs, upstream river gauge flows are increasing, and the NWS forecasts Lower Granite inflow to exceed 300 kcfs.

~~**iv.**~~**v.** On or after June 21 (start of summer spill), when average daily total project outflow is less than 30 kcfs and forecasted to remain below 30 kcfs for three days or more on a declining hydrograph, the RSW will be closed and spill will be distributed in patterns for spill with no RSW in **Table LWG-9**.

~~**v.**~~**vi.** When the project is not spilling, ~~O~~operation of the RSW for short periods of time may be requested by the Project Biologist through CENWW during low flow years if it appears the juvenile fish transportation facility and barge holding capacities will be exceeded, as described in the *Juvenile Fish Transportation Plan* (**Appendix B**).

Table LWG-1. Lower Granite Dam Spill Patterns with No RSW (Bay 1 Closed). [a, b]

LWG Spill Patterns with No RSW - # Gate Stops per Spillbay								Total Stops	Spill
Bay 1	Bay 2	Bay 3	Bay 4	Bay 5	Bay 6	Bay 7	Bay 8	(#)	(kcfs)
CLOSE							1	**1**	**1.7**
CLOSE	1						1	**2**	**3.4**
CLOSE	1			1		~~1~~	1	**3**	**5.1**
CLOSE	1			1	~~1~~	1	1	**4**	**6.8**
CLOSE	1	1		1	~~1~~	1	1	**5**	**8.5**
CLOSE	1	1		1	~~1~~	1	2	**6**	**10.3**
CLOSE	2 ~~1~~	1		1	~~1~~	1 ~~2~~	2	**7**	**12.1**
CLOSE	2	1		1	1	1 ~~2~~	2	**8**	**13.7~~9~~**
CLOSE	2	1 ~~2~~	1	1	1	1 ~~2~~	2	**9**	**15.4~~7~~**
CLOSE	2	1 ~~2~~	1	2	1	1 ~~2~~	2	**10**	**17.2~~4~~**
CLOSE	2	1 ~~2~~	1	2 ~~1~~	1	2	2	**11**	**19.0~~1~~**
CLOSE	2	2	1 ~~2~~	2 ~~1~~	1	2	2	**12**	**20.8~~9~~**
CLOSE	2	2	1 ~~2~~	2 ~~1~~	2	2	2	**13**	**22.6~~7~~**
CLOSE	2	2	2	2	2	2	2	**14**	**24.5**
CLOSE	2	2	2	2	2	2	3	**15**	**26.4**
CLOSE	2	2	2	2	2	3	3	**16**	**28.3**
CLOSE	3	2	2	2	2	3	3	**17**	**30.2**
CLOSE	3	3	2	2	2	3	3	**18**	**32.1**
CLOSE	3	3	3	2	2	3	3	**19**	**34.0**
CLOSE	3	3	3	2	3	3	3	**20**	**35.9**
CLOSE	3	3	3	3	3	3	3	**21**	**37.8**
CLOSE	3	3	3	3	3	3	4	**22**	**39.6**
CLOSE	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**23**	**41.4**
CLOSE	4	3	3	3	3	4	4	**24**	**43.2**
CLOSE	4	4	3	3	3	4	4	**25**	**45.0**
CLOSE	**4**	**4**	**4**	**3**	**3**	**4**	**4**	**26**	**46.8**
CLOSE	4	4	4	3	4	4	4	**27**	**48.6**
CLOSE	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**28**	**50.4**
CLOSE	4	4	4	4	4	4	5	**29**	**52.3**
CLOSE	**5**	**4**	**4**	**4**	**4**	**4**	**5**	**30**	**54.2**
CLOSE	5	4	4	4	4	5	5	**31**	**56.1**
CLOSE	5	5	4	4	4	5	5	**32**	**58.0**
CLOSE	**5**	**5**	**5**	**4**	**4**	**5**	**5**	**33**	**59.9**
CLOSE	5	5	5	4	5	5	5	**34**	**61.8**
CLOSE	5	5	5	5	5	5	5	**35**	**63.7**
CLOSE	5	5	5	5	5	5	6	**36**	**65.6**
CLOSE	5	5	5	5	5	6	6	**37**	**67.5**

a. This table defines patterns in increments of one gate stop per row. Spill (kcfs) is calculated as a function of total stops at forebay elevation 734.0 ft (**bold** patterns evaluated w/ Corps' LWG 1:80 physical general model).
b. When total project outflow is < 30 kcfs, the RSW will be closed and spill distributed in patterns in this table.

Add footnote to **Table LWG-8. Spring Spill** and **Table LWG-10. Summer Spill**:
b. RSW in Bay 1= fixed spill of ~6.8 kcfs at forebay 734.0 ft. Tainter gate does not regulate flow and should be raised ≥ 9 stops to not interfere with RSW flow. When total project outflow is < 30 kcfs, RSW will be closed and spill distributed in patterns defined in **Table LWG-9.**

Comments:

1/28/16 FPP Meeting: clarified criteria to close RSW (highlighted). Same for IHR and LMN.

Record of Final Action: APPROVED at FPP meeting 1/28/2016.