

## OFFICIAL COORDINATION REQUEST FOR NON-ROUTINE OPERATIONS AND MAINTENANCE

**TITLE-** WVP04 Hills Creek Dam Ramp Refill Restrictions IRRM

**COORDINATION DATE-** 14 February 2020

**PROJECT-** Hills Creek

**RESPONSE DATE-** 12 March 2020

**Description of the problem** – The U.S. Army Corps of Engineers (USACE) dam safety program includes inspections, monitoring, emergency action planning, and risk assessments. These inspections identified a rock fall that occurred over the winter of 2018-2019, resulting in a significant blockage at the spillway chute. If the spillway is required to pass flow in its current condition, the rock debris will obstruct and deflect flows towards the powerhouse and potentially the toe of the main dam embankment, resulting in damage and erosion of the concrete structures. The re-direction of the spillway flow could flood the lower levels of the powerhouse resulting in loss of power generation and potential environmental releases. An interim risk reduction measure (IRRM) is proposed to temporarily alter the rate at which Hills Creek refills as shown in Figure 1 in the green dashed line. This IRRM is to reduce the likelihood that the spillway would be required to pass flow, while a more permanent solution is found. This IRRM will be implemented concurrently with the recently proposed maximum conservation pool restrictions as shown in the red dashed line below, with the proposed refill rate modification in green. USACE is in process to developing and designing plans for maintenance and repairs to the spillway.

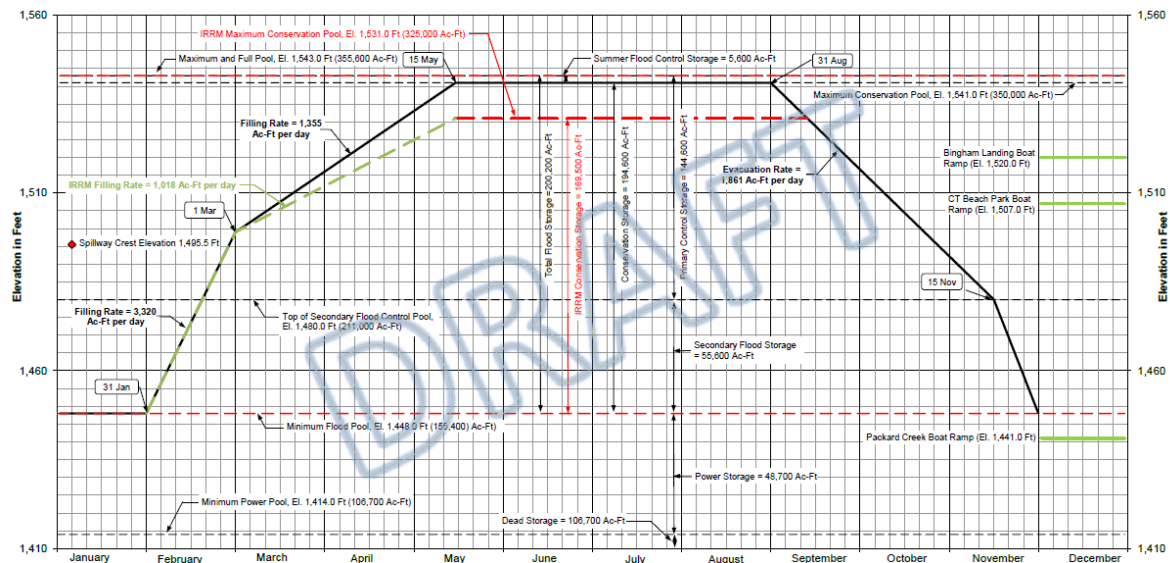


Figure 1. Ramp Refill Restriction represented by the green dashed line and the IRRM Conservation Pool Restriction shown in red dashed line.

**Type of outage/change required** – The change would temporarily modify the operations, or rule curve, for Hills Creek Dam. The rate of refill would change at Hills Creek from a filling rate of 1,355 ac-ft per day to 1,018 ac-ft per day from 1 March to 15 May, starting in 2020.

**Impact on facility operation** – Impacts of the lower refill rate were modeled by utilizing the Corps' Hydrologic Engineering Center (HEC) ResSim analysis tool. The effects of the restriction

were modeled for water years 1935-2008. The effect of the refill rate restriction plus the conservation pool restriction was compared to the baseline with no IRRM restrictions in place. Five additional BiOp target flow days were missed in Albany; at Salem no additional BiOp target flow days were missed. One day of BiOp target flow was missed in early August (1-15) during deficit water years, with the remaining days occurring in the time period from 15 August – 30 September in both adequate and deficit water years.

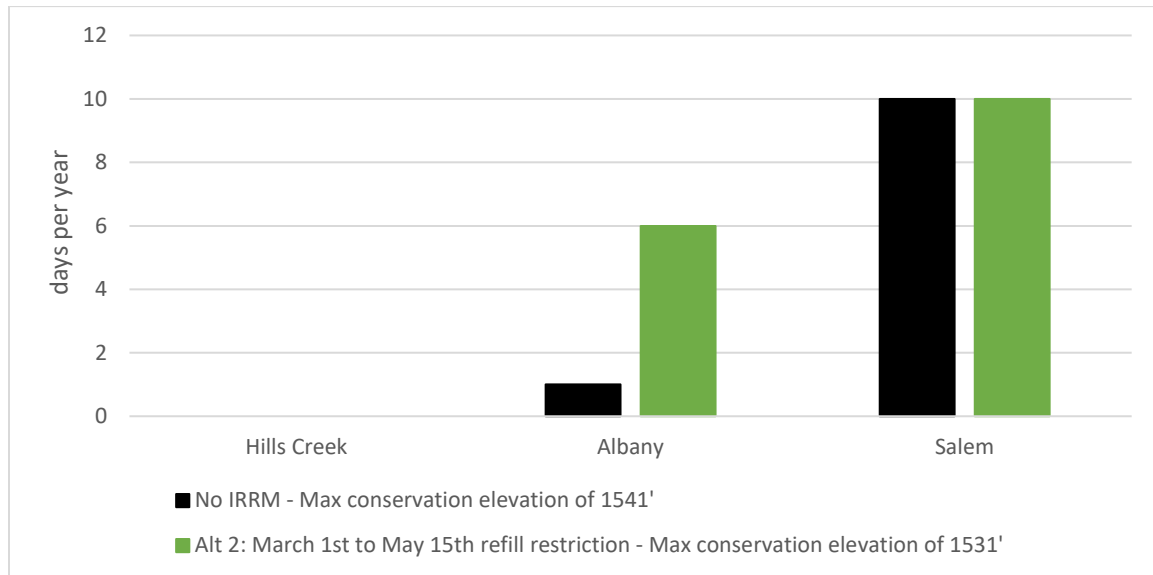


Figure 2. Median number of days per water year when flow targets are not met at Dexter, Albany, and Salem, Albany, and Dexter for baseline (black) and proposed forebay restrictions (green).

**Dates of impacts/repairs** – Refill Rate Restrictions would be implemented starting March 1<sup>st</sup> until May 15th, starting in 2020 and continuing until the rock debris is removed from the spillway.

**Length of time for repairs** – To be determined; likely around three years. Plans for removal and repair are in progress.

**Expected impacts on fish** – Modeling indicated that the anticipated temperature increase that would result from the refill restriction was 0.1 – 0.2 °C as measured at Albany, Oregon (Table 1). While the Corps is completing temperature modeling for directly below the dams, the water temperature increase there is expected to be minimal based on previous modeling exercises (Norm Buccola, pers. comm.).

Week	2018 Baseline Temperature	Refill Restriction: March 1st to May 15th + Max conservation elevation of 1531'
1-7 June	15.7	15.7
8-14 June	16.4	16.4
15-21 June	20.2	20.2
22-30 June	20.3	20.3
1-7 July	20.4	20.4
8-14 July	21.3	21.3
15-21 July	21.9	21.9
22-31 July	22.9	22.9
1-7 August	22	22.0

8-14 August	22	22.1
15-21 August	21	21.1
22-31 August	20	20.0
1-7 September	19.9	20.5
8-14 September	19.8	20.3
15-21 September	18.1	18.3
22-30 September	17.4	17.6
1-7 October	17.2	17.3
8-14 October	16	16.0
15-21 October	14.7	14.8
22-31 October	13.5	13.5
<b>Average Number of Weeks above 18C</b>	<b>13.0</b>	<b>13.0</b>
<b>Average Number of Weeks above 22C</b>	<b>1.0</b>	<b>2.2</b>

*Table 1. Temperature Impact Summary for the Willamette River at Albany Resulting from Pool Restrictions at Hills Creek and Lookout Point.*

Impacts to fish are expected to be small. Spring Chinook are the only ESA-listed fish in the Middle Fork Willamette River below Dexter. Due to the low productivity currently experienced below Dexter (Greg Taylor, pers. comm.), the overall impacts of the proposed forebay restrictions are anticipated to be minimal. Measurable impacts are negligible by the time the river reaches Salem.

Please email or call with questions or concern.  
Thank you,

Ida Royer  
U.S. Army Corps of Engineers  
503.808.4776  
Ida.M.Royer@usace.army.mil

**Comments from agencies** – No comments

**Final results** – Refill restrictions have been implemented.