

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

**TITLE** - 20WVP01 HCR and LOP Summer Reservoir Restrictions

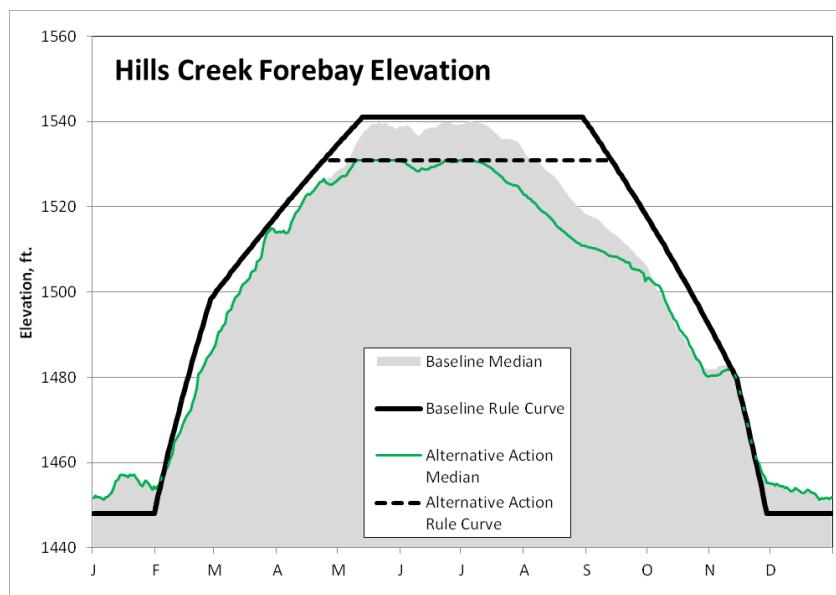
**COORDINATION DATE** - 06 January 2020

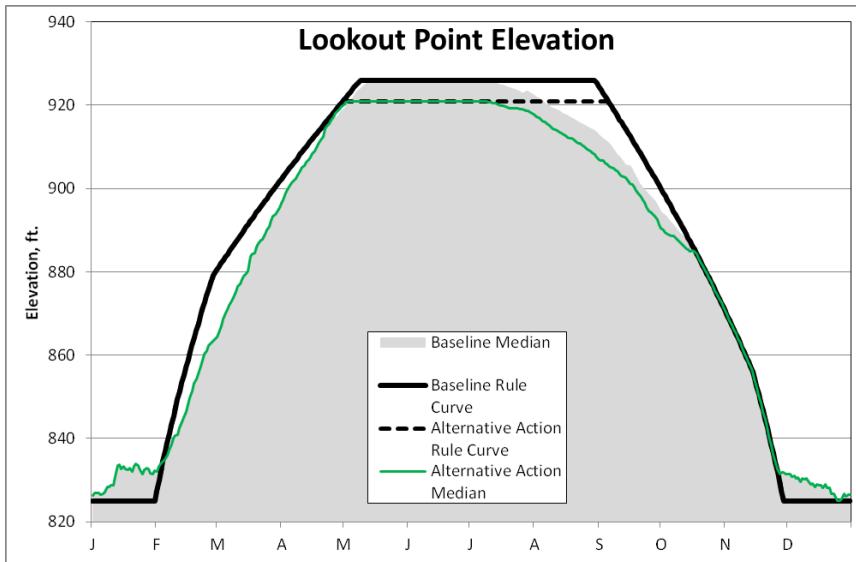
**PROJECT** - Hills Creek and Lookout Point

**RESPONSE DATE** - 20 January 2020

**Description of the problem** – The USACE dam safety program includes inspections, monitoring, emergency action planning, and risk assessments. USACE is conducting advanced risk assessments called Issue Evaluation Studies (IES) at several Willamette Valley Project (WVP) dams including Lookout Point and Hills Creek dams. The risk assessment evaluates the life safety risks associated with the dams to inform future risk reduction actions. Results of these studies for Hills Creek (HCR) and Lookout Point (LOP) dams identified the life-safety risk to be high and moderate respectively. The risk for both projects is driven by extreme seismic loadings in combination with high reservoir elevations at the time of the loading. Because there is potential for large life-safety consequences associated with dam failure, immediate action is warranted to reduce risk to tolerable levels. Interim risk reduction measures (IRRMs) have been proposed to reduce life-safety risk while issues are studied further and permanent measures are being pursued. These measures involve reducing the maximum conservation pool (summer storage) of HCR and LOP reservoirs by 10 feet and 5 feet, respectively, starting in the spring of 2020.

**Type of outage/change required** – The change would temporarily modify the operations, or rule curves, for both HCR and LOP. The maximum conservation pool would change at Hills Creek from elevation (EL) 1541 to EL 1531, and at Lookout Point from El 926 to 921 (Figure 1).





**Figure 1.** Rule curves for Hills Creek (top) and Lookout Point (bottom) dams. The current (dark line) and proposed (dashed line) rule curve with the median for current (shaded region) and proposed (green line) operations.

### Impact on facility operation –

Impacts of the lower conservation pools 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 results were then compared to 2018, which is considered a normal water year and served as a baseline.

The restrictions resulted in an average 3% reduction in water storage for the WVP system compared to 2018. (Storage compensation by other dams in the WVP were not considered.) In insufficient or deficit water years the proposed restrictions cause no change in operations, due to the fact that the conservation pool is not met in dry years. In normal to high water years, however, outflows for HCR and LOP are higher in April - May, when some inflows that would typically be stored in the reservoir are released to maintain the restricted elevations. Similarly, outflows are lower in September - October, when there is less water to evacuate during the fall drawdown.

Flows at Salem and Albany (downstream of the action area) are lower than in the Baseline in October, but do not result in changes to the frequency at which flow targets (NMFS 2008 Biological Opinion) can be met at these locations (Figure 2).

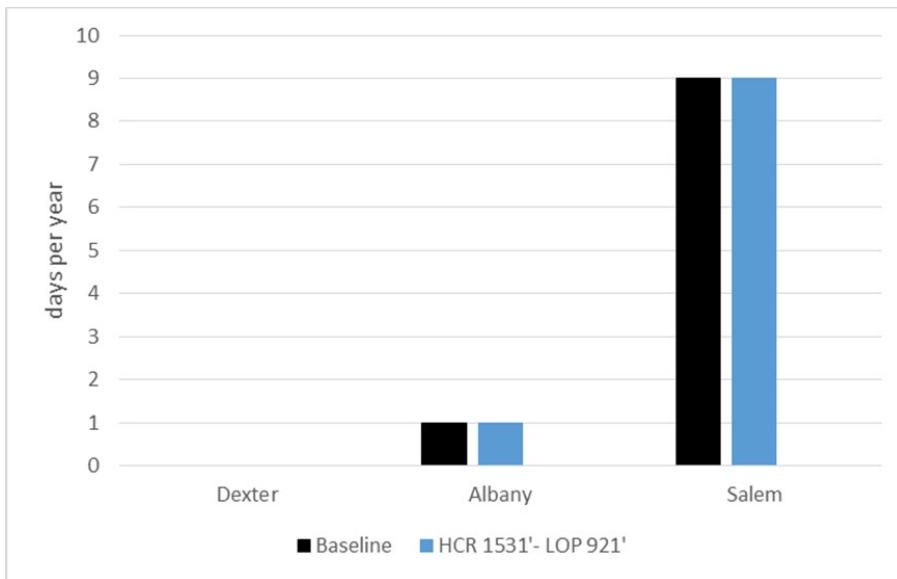


Figure 2. Median number of days per water year when flow targets are not met at Dexter, Albany, and Salem, Albany, and Dexter for baseline (black) and proposed forebay restrictions (blue).

**Dates of impacts/repairs** – Reservoir restrictions would be during the maximum conservation pool, 15 May – 31 August at HCR and 10 May – 31 August at LOP, starting in 2020 and continuing until a permanent fix occurs (date TBD).

**Length of time for repairs** – TBD. The IES is continuing at Hills Creek and expected to be complete in 2021 or 2022. A dam safety modification study (DSMS) is starting in January 2020 for Lookout Point dam to study permanent risk reduction measures including physical repairs and operational changes. This study is scheduled to be complete in 2021 or 2022.

**Expected impacts on fish** – Modeling indicated that the anticipated temperature increase that would result from the reservoir restrictions 0.1 – 0.2 °C as measured at Albany, Oregon (Table 1). Temperature modeling of the reservoirs and directly below the dams was done for 2002 and 2006 calendar years and showed minimal impacts to water temperature (see attached summary):

- IRRM scenarios were marginally warmer than NAA in summer (both 2002 and 2006) and cooler than baseline (NAA) during fall (2002 only).
- Estimated chinook emergence timing likely not to exceed 2 days difference from baseline (NAA)
- Minor increase in the number of days above 60.7 °F [16 °C]

While there is some reduction in the volume of water that would be heated in the lakes due to solar radiation, compared to baseline conditions, all scenarios specify deep releases from the penstocks which leads to minor expected temperature changes downstream of DEX. Modeling for TDG at Dexter Dam was also conducted, and indicated that in high flow years TDG levels above the 110% Oregon state standard could be expected for one day in April and three additional days (relative to the baseline) in October.

Week	2018 Baseline Temperature	HCR 1531' LOP 921'
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	22.0	22.0
8-14 August	22.0	22.0
15-21 August	21.0	21.0
22-31 August	20.0	20.0
1-7 September	19.9	20.0
8-14 September	19.8	20.0
15-21 September	18.1	18.3
22-30 September	17.4	17.6
1-7 October	17.2	17.3
8-14 October	16.0	16.1
15-21 October	14.7	14.8
22-31 October	13.5	13.5
Average Number of Weeks above 18C	13.0	13.0
Average Number of Weeks above 22C	1.0	1.0

Temp Scale °C

	22.5
	20.0
	17.5
	15.0
	12.5

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 negligible. Effects of the forebay restriction only occur in average to high water years. The biggest effect is an increase of four days in April-May that TDG exceeds the 100% state standard at Dexter Dam. Due to the low productivity of spring Chinook salmon below Dexter (Greg Taylor, pers. comm.), the overall impacts of the proposed forebay restrictions are anticipated to be minimal.

### Comments from agencies

No comments

### Final results

IRRMs have been implemented.

Please email or call with questions or concern.

Thank you,

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