ADJUSTMENT OF SYSTEM REFILL

Flood Risk Management Requirements
Report #7 for Water Year 2018
Issue Date: 03 MAY 2018

A. Purpose of Flood Risk Management Requirements. These requirements provide maximum end-of-month reservoir elevations and/or minimum outflows for flood risk management projects in the Columbia River Basin. These requirements are for use by U.S. Army Corps of Engineers, Bureau of Reclamation, Idaho Power, Energy Keepers, BC Hydro and Bonneville Power Administration for operations planning and include all formally approved deviations to date. Any deviation from the flood risk management requirements herein will require approval from the Chief, Columbia Basin Water Management Division (CBWM) per the Northwestern Division's (NWD) Deviation Policy (NWDR 1110-2-6). Requirements are in accordance with the Columbia River Treaty Flood Control Operating Plan (FCOP) and any project-specific water control manuals, with variations as described below. These flood risk management requirements will be revised and re-issued as new information becomes available.

B. List of Approved Flood Deviations from Water Control Manuals.
There are currently no deviations in place.

C. Flood Risk Management Requirements
These requirements have been prepared using the most recent official seasonal volume forecasts. The April-August volume forecast at The Dalles Dam based on the April 2018 official forecast is 103,337 kaf. All other forecasts can be found in Table 2 or at:
http://www.nwd-wc.usace.army.mil/report/colsum/

Table 1 shows the flood risk management elevations, draft and flow limits for the evacuation, holding and refill periods. The Initial Controlled Flow (ICF) based on the April forecast is 381 kcfs and the ICF date has been declared as May 6, 2018. See the FCOP for how the ICF is computed. More details on the values used can be found at:
http://www.nwd-wc.usace.army.mil/report/storcorr/

D. System Flood Risk Management Refill Requirement Discussion.
The ICF date was declared as May 6, for an ICF of 381 kcfs. The ICF flow rate was based on the official April 2018 seasonal runoff volume forecast. However, based upon the most recent ESP traces, there is a need to set a Controlled Flow (CF) of 420 kcfs. If needed, the CF will be further updated as the system is managed for flood risk. The Flood Risk Management Requirements shown in Table 1 are based on the official April 2018 seasonal runoff volume forecast.

E. Individual Project Flood Risk Management Requirements Discussion.
Dworshak: Dworshak is operating to its refill guide curve. The end of May FRM elevation is at 1565.8 feet.

Brownlee: Brownlee is operating to assist in providing short term FRM needs at The Dalles, releasing approximately 20 kcfs per day through May 5.

Table 1. Flood Risk Management Requirements

Project	31Jan	28Feb	31Mar	15 Apr	30 Apr	Date Refill Starts	31 May[3]	30 Jun[3]	31 Jul[3]
MCDB (kaf) [2]	1662	2810.0	3267.0	4080.0	4080.0	01 May	2448.0	286.0	0.0
ARDB (ft)	1430.5	1422.9	1408.5	1414.1	1414.1	04 May	1425.1	1443.2	1444.0
DCDB (ft)	1839.5	1812.5	1807.7	1807.7	1807.7	26 Apr	1834.5	1877.3	1892.0
LIB (ft) [4]	2401.8	2387.7	2358.3	2359.3	2362.4[4]	26 Apr	Est	Est	2459.0
LIB (cfs)	n/a	n/a	n/a	n/a	9.2	26 Apr	~9.2	n/a	n/a
HGH (ft)	3541.5	3529.6	3496.2	3476.6	3475.4	01 May	3542.1	3560.0	3560.0
SKQ (ft)[5]	n/a	n/a	n/a	2883.0	n/a	-	2890.0	2893.0	2893.0
ALF (ft) [1]	2060.0	2060.0	2056.0	n/a	2056.0	-	2062.5	2062.5	2062.5
GCL (ft)	1290.0	1289.6	1256.9	1234.0	1222.7	05 May	1259.5	1289.4	1290.0
BRN (ft)	2077.0	2046.8	2037.2	2025.0	2030.0	05 May	2069.2	2077.0	2077.0
DWR (ft)	1530.5	1516.5	1461.6	1470.0	1500.0[6]	05 May	1565.8[6]	1599.2	1600.0

Notes:
1. Albeni Falls flood risk management elevations are based on readings at the Hope gage.
2. KAF units refer to required flood risk management space (draft) in the reservoir.
3. Flood risk management requirements for May, June and July are based on estimated normal runoff shape. Under certain circumstances, the Refill Guide Curve (also known as Flood Control Refill Curve) procedure may be used to determine when refill is to begin at each project where applicable.
4. Per the Libby Dam WCM, Rule 1 of the VarQ operating procedures, releases will be limited to the hydraulic capacity of the powerhouse to the best extent possible. Estimated end of April elevation is 2362.4 feet.
5. Sẻliš Ksanka Qĺispẻ Dam, formerly known as Kerr Dam.
6. Dworshak is filling on its refill guide curve, with end of April FRM of 1500 feet.

Table 2. Water Supply Forecasts (Kaf)

Project	Forecast Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Current Month Forecast % of Normal	Residual Runoff[3] (%)
MCDB	Apr-Aug	11117	11334	11753	11727				107	96
ARDB	Apr-Aug	21606	22445	23532	23310				106	94
DCDB	Apr-Aug	1995	2061	2174	2208				110	93
LIB	Apr-Aug	6645	6765	7205	7189				122	96
HGH	May-Sep	1964	2062	2302	2395				141	99
SKQ[1,2]	Apr-Jul	5595	7346	7573	8241				142	87
ALF[1]	Apr-Jul	12382	15152	15578	17016				144	84
GCL[1]	Apr-Aug	55852	64817	65870	68335				120	88
BRN[1]	Apr-Jul	5690	5509	5665	6436				118	69
DWR	Apr-Jul	2941	2849	3093	3040				126	75
TDA[1]	Apr-Aug	87282	94748	98132	103337				118	83

Notes:
1. Official water supply forecasts for SKQ, ALF, GCL, BRN and TDA are the ESP 5-day-QPF median values published by the NWRFC on the following days for 2018: Jan 4, Feb 5, Mar 5, Apr 5, May 3, Jun 5, and Jul 6.
2. Sẻliš Ksanka Qĺispẻ Dam, formerly known as Kerr Dam.
3. Residual runoff is the percentage of the current month's seasonal volume forecast that has yet to runoff.

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