Flood Risk Management Requirements
Report #6 for Water Year 2016
Issue Date: 21 April 2016

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 approved deviations in effect.

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 2016 official forecast is 86,867 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 321 kcfs and the ICF date has been declared as April 22, 2016. 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.
Columbia Basin Water Management is declaring the initiation of system refill as summarized in Table 1. Note that each reservoir may begin refill on the prescribed date. Until a reservoir's refill date is reached, that reservoir must be no higher than the prescribed 30 April flood risk requirement elevation. During the runoff season, end-of-month reservoir elevation targets and control flow may change in response to the shape and timing of the runoff.

E. Individual Project Flood Risk Management Requirements Discussion.
No specific individual requirements at this time.

Table 1. Flood Risk Management Requirements

Project	31Jan	29Feb	31Mar	15 Apr	Date Refill Starts	30 Apr[3]	31 May[3]	30 Jun[3]	31 Jul[3]
MCDB (kaf) [2]	1648	2824	4080	4080	17 Apr	4080	2448	286	0
ARDB (ft)	1430.5	1422.9	1414.1	1414.1	20 Apr	1417	1430	1444	1444
DCDB (ft)	1839.8	1813.8	1811.1	1810.2	12 Apr	1823	1844	1880	1892.0
LIB (ft) [4]	2411.0	2407.0	2397.8	2387.4	12 Apr	Est	Est	Est	2459
LIB (cfs)	n/a	n/a	n/a	n/a	12 Apr	16.5	15	n/a	n/a
HGH (ft)	3547.0	3547.9	3545.4	3545.6	01 May	3545	3550	3560	3560
SKQ (ft)[5]	n/a	n/a	n/a	2883.0	-	n/a	2890	2893	2893
ALF (ft) [1]	2060.0	2060.0	2056.0	n/a	-	2056	2062.5	2062.5	2062.5
GCL (ft)	1290.0	1290.0	1274.7	1254.5	21 Apr	1249	1272	1290	1290
BRN (ft)	2077.0	2051.6	2061.1	2054.0	21 Apr	2051	2068	2077	2077
DWR (ft)	1556.4	1557.0	1569.0	1563.7	21 Apr	1571	1593	1600	1600

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. Under certain circumstances, the Refill Guide Curve (RGC) 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. Per the Libby Dam WCM, Rule 8 of the VarQ operating procedures, releases can be adjusted prior to June 30th at Libby Dam to control refill.
5. Sə̀liš Ksanka Qĺispə̀ Dam, formerly known as Kerr Dam.

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	11010	11230	11021	11042				101	96
ARDB	Apr-Aug	22136	22618	21989	22543				103	94
DCDB	Apr-Aug	2063	1978	1961	1972				98	94
LIB	Apr-Aug	6249	6318	6472	6681				114	93
HGH	May-Sep	1629	1531	1573	1556				92	100
SKQ[1,2]	Apr-Jul	4785	5061	5165	5257				91	86
ALF[1]	Apr-Jul	10294	10381	10478	10829				92	85
GCL[1]	Apr-Aug	52783	54491	56411	57009				100	91
BRN[1]	Apr-Jul	4693	4689	4623	4767				87	84
DWR	Apr-Jul	1913	1986	2025	2308				95	78
TDA[1]	Apr-Aug	82621	83221	86527	86867				99	89

Notes:

1. Official water supply forecasts for SKQ (KERM), ALF, GCL, BRN and TDA are the ESP 5-day-QPF median values published by the NWRFC on the following days for 2016: Jan 8, Feb 5, Mar 7, Apr 7, May 6, Jun 7, and Jul 8.
2. Sə̀liš Ksanka Qĺispə̀ Dam, formerly known as Kerr Dam.
3. Residual runoff values are applicable beginning in April. Residual runoff (%) is the percentage of the current month's seasonal volume forecast that has yet to runoff during the forecast period. For example, 93% of the forecasted April through August runoff volume for Libby has yet to runoff. For Hungry Horse the forecast is a May through September volume and therefore the entire forecast volume has yet to begin running off.

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