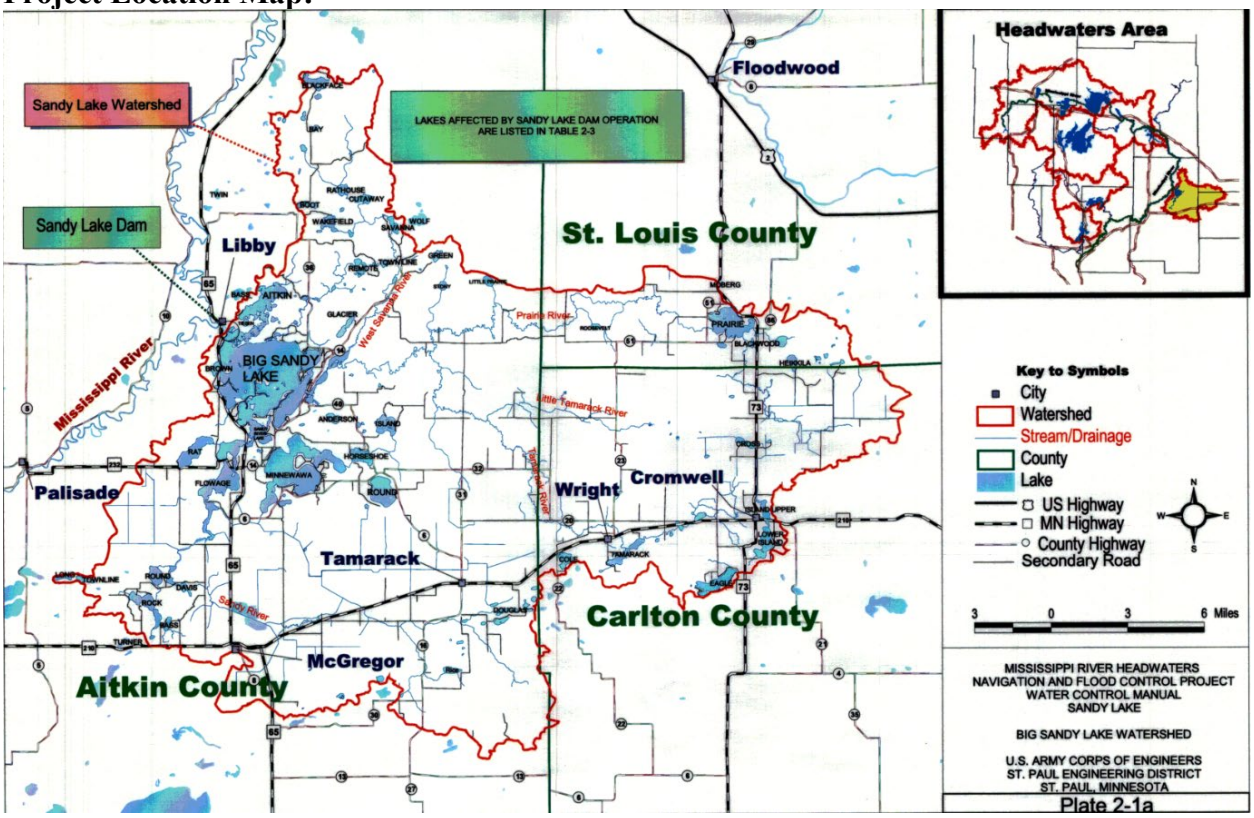
Reservoir Summary: Big Sandy Lake and Big Sandy Lake Dam

Project General Objectives: The reservoir is regulated primarily for recreation, flood control, fish and wildlife and Tribal Trust. The Water Control Plan supports recreation by maintaining, when possible, stable reservoir levels within a specified elevation band during the summer. Flood control objectives are met by a fall/winter drawdown schedule and a designated flood control storage pool, which provides storage capacity for spring and summer flood events. Water levels are managed, when conditions permit, for various fish and wildlife and Tribal Trust concerns. The low-flow plan manages water resources both upstream and downstream of the dam during critical periods.

Project Location Map:



Pertinent Data:
Datum = NGVD 29

Sandy Lake	Elevation in Feet	Area in Acres	Cumulative Storage in Acre-Feet
Top of Control Structure	1221.31	12,900	118,000
Maximum Operating Limit	1218.31	10,700	82,000
Normal Summer Pool Level	1216.31	9,400	62,000
Minimum Operating Limit	1214.31	8,100	44,000
Sill	1207.31	---	0

HYDROLOGY

Drainage Area	421 square miles
One Inch of Runoff Equals	22,453 acre-feet
Storm Types	Thunderstorm, frontal rain, snow
Flood Season	15 March - June
Low Flow Season	July - October
Minimum Daily Inflow	Flow is very low during dry periods.
Minimum Mean Monthly Inflow	Flow is very low during dry periods.
Minimum Mean Annual Inflow	76 cfs, 1934
Maximum 24-hr. Average Inflow	6,910 cfs, 8 May, 1950
Maximum Mean Monthly Inflow	2,870 cfs, May 1950
Maximum Mean Annual Inflow	549 cfs, 1953
Average Annual Inflow	249 cfs, (Period, 1899-1985)
Maximum Flood Volume from Mississippi River included)	254,600 ac-ft, April 16 - June 8, 1950 (overflow
Name and Location of Key Stream-Flow Stations	Mississippi at Aitkin, Minnesota and Aitkin diversion channel

Watershed Characteristics

Sandy Lake Dam was built on the outlet of Sandy Lake, a lake on the Mississippi River headwaters. The runoff from Sandy Lake watershed is slow and significantly attenuated as a result of the relatively flat topography and the presence of many lakes and wetlands. Sandy Lake Dam controls the runoff from a 420 square mile area, of which 31 percent is dry land, 12 percent is water, and 57 percent is wetlands. In general, the land not covered by wetlands is forested. The average overland slope is 14.78 feet per mile

Figure 1 shows a duration hydrograph of the discharges from the dam.

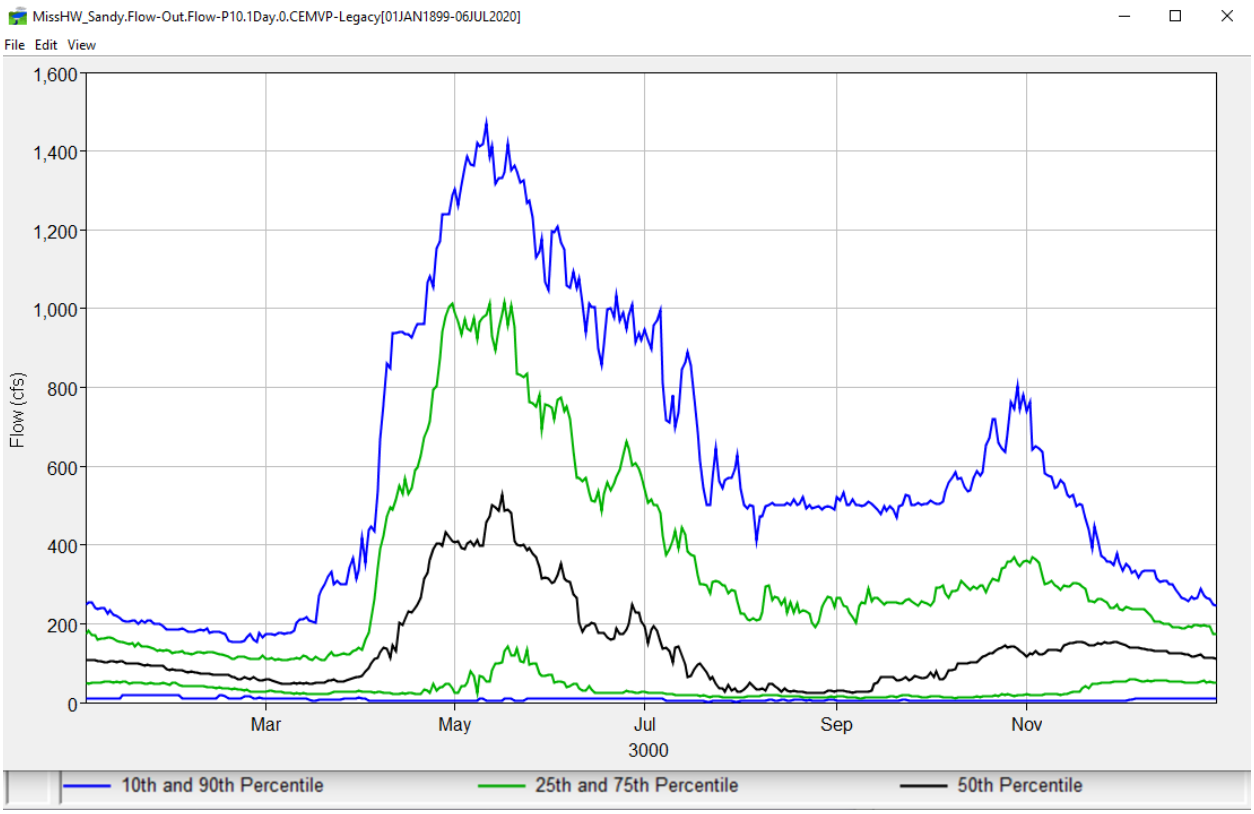
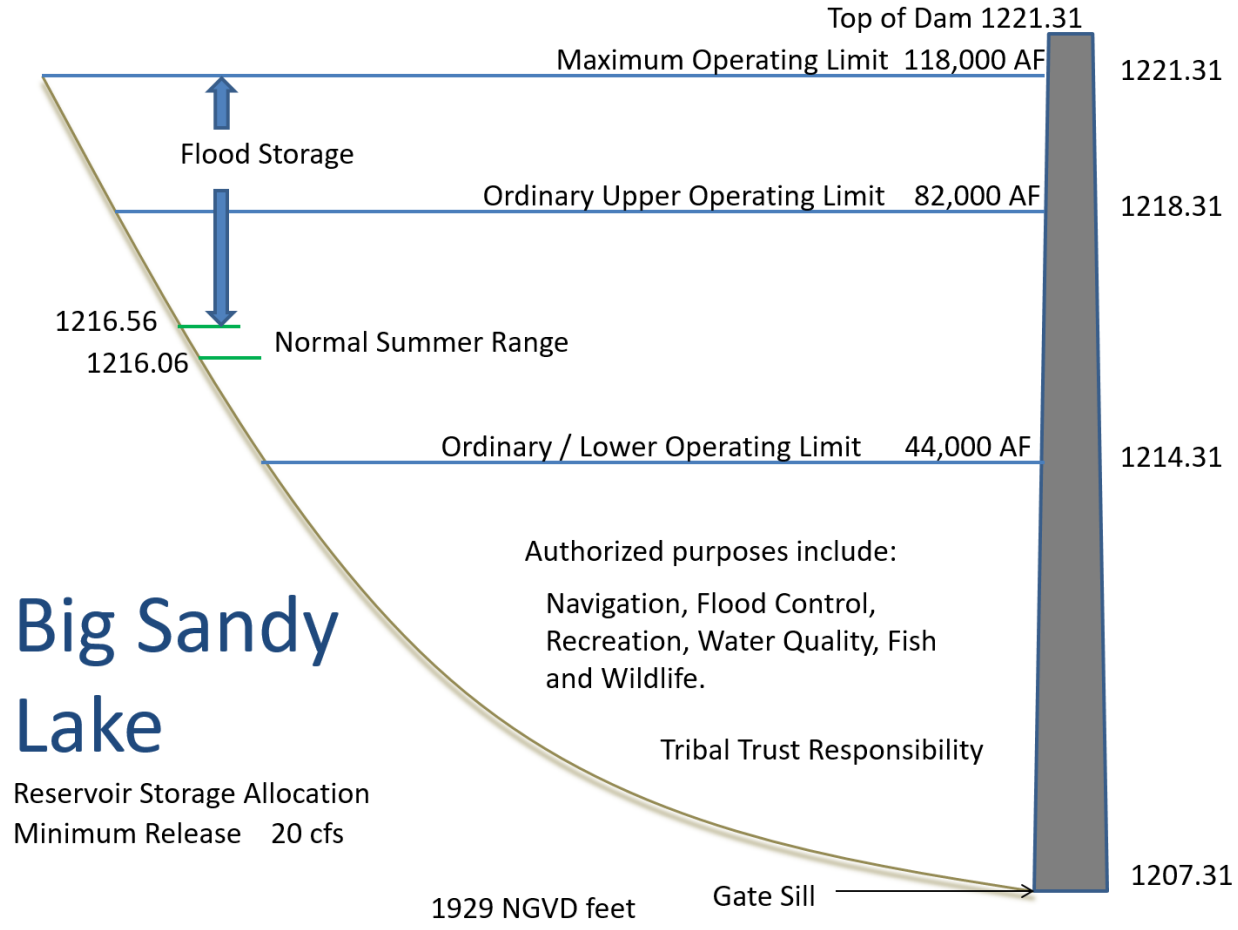


Figure 1. Duration hydrograph for Big Sandy Lake discharges.

Pool Allocation



Overall Plan for Water Control

Sandy Lake reservoir is regulated between a minimum elevation of 1214.31 feet and a maximum elevation of 1221.31 feet. If possible, the reservoir level should be within its summer range/band of 1216.06 feet to 1216.56 feet by the first day of the fishing season (approx. mid-May). The winter drawdown of the reservoir for spring flood control begins in the fall. The ordinary (normal) spring drawdown elevation is 1214.31 feet, which is the lower operating limit of the reservoir. Significant shoreline erosion begins to occur at approximately elevation 1218.31 feet but storage to elevation 1221.31 feet can be used if needed to prevent flooding downstream.

The Water Control Manuals (WCM) are in the process of being updated with the findings of the 2009 Reservoir Operating Plan Evaluation (ROPE) Study. The table below summarizes reservoir operation for both the WCM and ROPE parameters.

TABLE S-7 SANDY LAKE OPERATING RULES		
	CURRENT	FINAL
Summer Band (elev. - feet)	1216.06-1216.56	1216.06-1216.56
Summer Target (elev. - feet)	1216.31	1216.31
Band Width (ft.)	0.5	0.5
Normal Drawdown (elev. - feet)	1214.31	1214.31
Maximum Drawdown (elev. - feet)	1214.31	1214.31
Rate of Release (change/day)	20-30%	20-30%
Spring Pulse	NA	490 cfs
Minimum Flow Requirements	>=(1214.31): 20 cfs	>=(1214.31): 20 cfs
	<(1214.31): 10 cfs	<(1214.31): 10 cfs

Figure S-5. Final Plan Operating Hydrograph, Sandy Lake