

Lake McConaughy and Tri-County System General Operating Rules

Appendix 6-D contains the general operating rules for Lake McConaughy provided by Central Nebraska Public Power and Irrigation District staff. These general rules provided the framework for the calibration effort, with iterative adjustments to the operating rules and criteria made throughout calibration in concert with the Sponsor technical workgroup.

Central's General Operations of Lake McConaughy, the Supply Canal, and the Irrigation Systems

Modes of Operation

Drought Mode of Operation- (2005-2008)

September Lake Mac carryover < 500,000 ac-ft, or
Annual Lewellen inflow of less than 600,000 ac-ft

Irrigation Season operations- only release for irrigation demand, Central allocating deliveries (reduced season length and reduced deliveries) to its customers and using existing system storage to finish irrigation season (August drawdown of system reservoirs).

Non Irrigation Season operations- only release to maintain Sutherland Reservoir and protection against icing condition, apply for FERC waiver of winter release requirements (winter releases will most likely average less than the FERC minimum flows of 250 cfs)

System component Operations

Keystone Canal- Run as much as possible during irrigation season, low flows during non-irr

Keystone River- some irr releases for NPPD and Central, all irrigation releases for North Platte Canals (below Mac-above North Platte), no flow during non-irr

CNPPID Diversion- Divert all available water at North Platte when possible, some water passing during irrigation for irr demand in excess of Jeffrey Return capacity or availability

Jeffrey Return- release as much as possible for NPPD irrigation demand only

Elwood Res- not used during Central's allocated irrigation delivery season

J2 Return- used during non-irr season to return natural flow, no water intentionally passed during irr season

Irrigation Demand (2002-2005)

September Lake Mac carryover < 700,000 ac-ft, or
Annual Lewellen inflow of less than 700,000 ac-ft

Irrigation Season operations- only release for irrigation demand, probably full irrigation demand for entire system and using existing system storage to finish irrigation season (August drawdown of system reservoirs).

Non Irrigation Season operations- only release to maintain Sutherland Reservoir and protection against icing condition and meet FERC minimum winter release requirements, no emphasis on keeping NPPD's system full or North Platte Hydro in operation all winter. Minimum flows may keep NPPD's system full and operational but no additional water over FERC minimums will be released for this purpose.

System component Operations

Keystone Canal- Run as much as possible during irrigation season, low flows during non-irr

Keystone River- some irr releases for NPPD and Central, all irrigation releases for North Platte Canals (below Mac-above North Platte), no flow during non-irr

CNPPID Diversion- Divert all available water at North Platte when possible, some water passing during irrigation for irr demand in excess of Jeffrey Return capacity or availability

Jeffrey Return- release as much as possible for NPPD irrigation demand only

Elwood Res- filled in spring for supplemental irrigation on E65

J2 Return- used during non-irr season to return natural flow, no water intentionally passed during irr season

Transitional Period (1990-1992, 2000-2002)

September Lake Mac carryover < 900,000 ac-ft, or

Annual Lewellen inflow of less than 800,000 ac-ft

Irrigation Season operations- Release for full irrigation demand with emphasis on keeping system lake levels up for the entire recreation season and producing no shortages of water for irrigation demand. No drawdown of system reservoirs but still not intentionally releasing water past the J2 return structure.

Non Irrigation Season operations- Release water to meet FERC minimum winter release requirements, with an emphasis on keeping NPPD's system full and North Platte Hydro in operation all winter. Not a full diversion, but most likely FERC minimum average flow each day with cyclical operation of the North Platte Hydro.

System component Operations

Keystone Canal- Run as much as possible during irrigation season, low flows during non-irr with NP Hydro Operations

Keystone River- some irr releases for NPPD and Central, all irrigation releases for North Platte Canals (below Mac-above North Platte), no flow during non-irr

CNPPID Diversion- Divert all available water at North Platte when possible, some water passing during irrigation for irr demand in excess of Jeffrey Return capacity or availability

Jeffrey Return- release as much as possible for NPPD irrigation demand only

Elwood Res- filled in spring for supplemental irrigation on E65

J2 Return- used during non-irr season to return natural flow, no water intentionally passed during irr season but higher likelihood of irrigation season use

Power Transitional period ()

September Lake Mac carryover < 1,100,000 ac-ft, or

Annual Lewellen inflow of less than 900,000 ac-ft

Irrigation Season operations- Release for full irrigation demand while running system at full capacity for entire irrigation season producing power with water in excess of irrigation demand.

Non Irrigation Season operations- Release water to meet FERC minimum winter release requirements. Physically release some water during storage season for power generation and guarantee a full diversion into Central's supply canal without intentionally wasting water down the river past Central's diversion dam.

System component Operations

Keystone Canal- as much as possible during irrigation season, used during winter to keep Central's diversion at full capacity

Keystone River- some irr releases for NPPD and Central, all irrigation releases for North Platte Canals (below Mac-above North Platte), no flow during non-irr

CNPPID Diversion- Full diversion all year, some water passing during summer for irr demand above Jeffrey Return capacity or availability

Jeffrey Return- release as much as possible for NPPD irrigation demand only

Elwood Res- filled in spring for supplemental irrigation on E65

J2 Return- used to return available flows to the river all year long

Power Generation Period (Most years)

September Lake Mac carryover < 1,400,000 ac-ft, or

Annual Lewellen inflow of less than 1,200,000 ac-ft

Irrigation Season operations- Release for full irrigation demand while running system at full capacity for entire irrigation season producing power with water in excess of irrigation demand.

Non Irrigation Season operations- Release water to meet FERC minimum winter release requirements, and or release for power generation. Release water to generate power in the storage season while keeping high flows or a full diversion into NPPD's Keystone canal. Most likely flows will exceed Central's diversion capacities and water will be released past the diversion.

System component Operations

Keystone Canal- Most likely high flows or full capacity all year long

Keystone River- some irr releases for NPPD and Central, all irrigation releases for North Platte Canals (below Mac-above North Platte), no flow during non-irr

CNPPID Diversion- Full diversion all year, some water passing during summer for irr demand or flows in excess of diversion capacity

Jeffrey Return- release as much as possible or needed for NPPD irrigation demand only (probably not needed very much due to excess water passing the diversion dam)

Elwood Res- filled in spring for supplemental irrigation on E65

J2 Return- used to return available flows to the river all year long

Power Generation Spill Avoidance (Few years 1971-1974, 1983-1984, 1986)

September Lake Mac carryover > 1,400,000 ac-ft, or

Annual Lewellen inflow of less than 1,400,000 ac-ft

Irrigation Season operations- Release for full irrigation demand while running system at full capacity for entire irrigation season producing power with water in excess of irrigation demand.

Non Irrigation Season operations- Release water to meet FERC minimum winter release requirements, and or release for maximum power generation keeping all systems at full capacity. Releases are based on inflows projections to keep Lake Mac within maximum storage requirements and not have to be released out of the morning glory.

System component Operations

Keystone Canal- Full capacity all year long

Keystone River- used for irrigation demand and all releases in excess of Keystone canal capacity

CNPPID Diversion- Full diversion all year, some water passing during summer for irr demand or flows in excess of diversion capacity

Jeffrey Return- not utilized, irrigation demand taken care of from water passing the diversion

Elwood Res- filled in spring for supplemental irrigation on E65

J2 Return- used to return available flows to the river all year long

***** KEY NOTES ******

Operations from 1995 to 1999 included both Power Generation and Spill Avoidance operations. Those years were all bordering both descriptions and are probably our best example of years when we have to decide on when to start the spill avoidance operations. As you can tell by the data and lake levels during this time period, inflows can change greatly from year to year and require different modes of operations.

2001 data should not be used when developing rules. In 2001 Central was intentionally releasing water to save room for storage in Lake Mac while Jeffrey, J1, and J2 were being rehabbed. Releases from Lake Mac were cut during the Hydro rehab in order to minimize the amount of water that passed the plant without producing power.