Overview of Reservoir Operations and Water Management in New Mexico

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Rio Grande Basin above Elephant Butte Reservoir
Perspective on Storage Volumes

- City of Albuquerque consumes roughly 50,000 acre-feet per year
- Bosque and riparian vegetation between Cochiti and Elephant Butte Reservoirs consumes about 250,000 acre-feet per year
- Supplemental ESA water leased and released by Bureau of Reclamation for silvery minnow has averaged about 50,000 acre-feet per year since 1996
- Long-term average flow at the Otowi gage is about 1,100,000 acre-feet per year
Heron Reservoir

- Located on Willow Creek just above Rio Chama
- Owned and operated by US Bureau of Reclamation
- Constructed in 1971 with capacity of 400,000 acre-feet
- Storage reservoir for San Juan-Chama Project water
- Not authorized for storage of native Rio Grande water
El Vado Reservoir

- Located on Rio Chama immediately below Heron
- Operated by US Bureau of Reclamation pursuant to agreement with MRGCD
- Ownership at issue in cross-claims in *Minnow v Keys*
- Constructed in 1935 with capacity of 180,000 acre-feet
- Primarily stores native Rio Grande water for irrigation use
- State Engineer Permit 1690 issued in 1930
Abiquiu Reservoir

• Located on Rio Chama roughly 30 miles below El Vado and approximately 30 miles above confluence of Rio Chama and Rio Grande
• Operated by US Army Corps of Engineers
• Constructed in 1963 with capacity of 1.2 MAF at spillway crest
• Part of Middle Rio Grande Project – original purpose was solely flood and sediment control
• Authorized in 1981 to store up to 200,000 acre-feet of San Juan-Chama Project water
• Authorized in 1988 to store up to 200,000 acre-feet of native Rio Grande if space not needed for San Juan-Chama water
McClure and Nichols Reservoirs

- Located on Santa Fe River a few miles upstream of the City of Santa Fe
- Owned and operated by the City of Santa Fe for conservation storage for municipal water supply
- McClure Reservoir originally constructed in 1926 and modified several times to its current capacity of 3,257 acre-feet
- Nichols Reservoir constructed in 1942 with 685 acre-feet of capacity
- Total combined capacity of 3,942 acre-feet
Cochiti Reservoir

- Located on Rio Grande roughly 50 miles upstream of Albuquerque
- Operated by US Army Corps of Engineers
- Constructed in 1963 with capacity of 590,000 acre-feet at spillway crest
- Part of Middle Rio Grande Project – original purpose was solely flood and sediment control
- Permanent recreation pool of 1,200 surface acres (~50,000 acre-feet) of San Juan-Chama Project water authorized in 1964
- Cochiti is the only mainstem reservoir above Elephant Butte in New Mexico
Galisteo Reservoir

• Located on Galisteo Creek ten miles upstream of Rio Grande

• Owned by US Army Corps of Engineers

• Constructed in 1970 with capacity of 90,000 acre-feet at spillway crest

• Releases are uncontrolled – what comes in equals what goes out with maximum rate of release of 5,000 cfs
Jemez Canyon Reservoir

- Located on Jemez River just upstream of Rio Grande
- Owned and operated by US Army Corps of Engineers
- Constructed in 1953 with maximum capacity of 100,000 acre-feet at spillway crest
- Currently operated as a dry reservoir
Legal Authorities

Rio Grande Compact

Federal Law

• Flood Control Acts of 1948 and 1950 – Middle Rio Grande Project and Abiquiu Reservoir

• PL 86-645 (1960) – Cochiti, Galisteo and Jemez Canyon Reservoirs; operational criteria for all four Middle Rio Grande Project Reservoirs

• PL 87-483 (1962) – San Juan-Chama Project and Heron Reservoir

• PL 88-293 (1964) – Permanent recreational pool at Cochiti Reservoir
Legal Authorities

**Federal Law**
- PL 97-140 (1981) – Storage of up to 200,000 acre-feet of San Juan-Chama water in Abiquiu
- PL 100-522 (1988) – Storage of up to 200,000 acre-feet of native Rio Grande water in Abiquiu if space not needed for storage of San Juan-Chama water
- ESA, NEPA, CWA

**State Law**
- State water code
- OSE rules and regulations
Water Operations – General Concepts

**Storage and Flow**

1 cubic feet per second for 24 hours = ~ 2 acre-feet of storage

**Conservation Storage**: water stored to meet a future use

**Flood Control Storage**: water stored to prevent or alleviate downstream flooding

**Permanent Storage**: water stored indefinitely to provide recreational and fish and wildlife benefits
Water Operations – General Concepts

Water Accounting

• All reservoir storage and flows at key gages accounted to ensure compliance with Rio Grande Compact

• San Juan-Chama Project water accounted to ensure compliance with authorizing legislation

• Accounting done down to the level of individual parties such as MRGCD storage, City of Albuquerque San Juan-Chama water, etc.
Water Operations – General Concepts

**Reservoir Operations:** rate and timing at which storage or inflow is released or detained

**Water Operations:** same as reservoir operations plus downstream monitoring to ensure desired flows are achieved. May also include diversion of released storage.

**Types of Water Operations**
- Irrigation
- Flood Control
- Environmental
- Recreational
Irrigation Operations

• Operations performed at call of MRGCD

• Involves changing rate and timing of releases from El Vado to provide sufficient flow in middle valley to meet irrigation diversion demand of MRGCD

• Also includes Prior and Paramount operations to ensure senior irrigation diversion requirements of the six Middle Rio Grande Pueblos are met
Flood Control Operations

- Operations performed at call of US Army Corps of Engineers
- Consist of adjusting rate and timing of releases or detention of inflow at Abiquiu, Jemez, Cochiti (and Galisteo) to ensure that flow levels at critical downstream locations are not exceeded
Environmental Operations

- Operations performed at call of US Bureau of Reclamation
- Two types:
  - To meet flow requirements of the endangered Rio Grande silvery minnow, using releases of leased stored water from willing sellers
  - To provide minimum flows for brown trout fishery in Wild and Scenic reach between El Vado and Abiquiu
Recreational Operations

• Operations performed at call of US Bureau of Reclamation
• Done to provide rafting flows in Wild and Scenic reach
• Requires cooperation of third parties (usually MRGCD and City of Albuquerque)
REFERENCES

• The Upper Rio Grande – A Guide to Decision-Making, Steven J. Shupe and John Folk-Williams, Western Network, Santa Fe