

# Historic El Vado Reservoir Operations

Utton Center Symposium on Rio Grande Reservoir Operations

Viola Sanchez

Ph.D. Student, Civil Engineering, UNM

April 22, 2006

# Disclaimer

- The material in this presentation is part of the research for a Ph.D. dissertation in civil engineering at the University of New Mexico by Viola Sanchez. It does not represent the views of the Bureau of Reclamation, Department of the Interior, or any other entity.

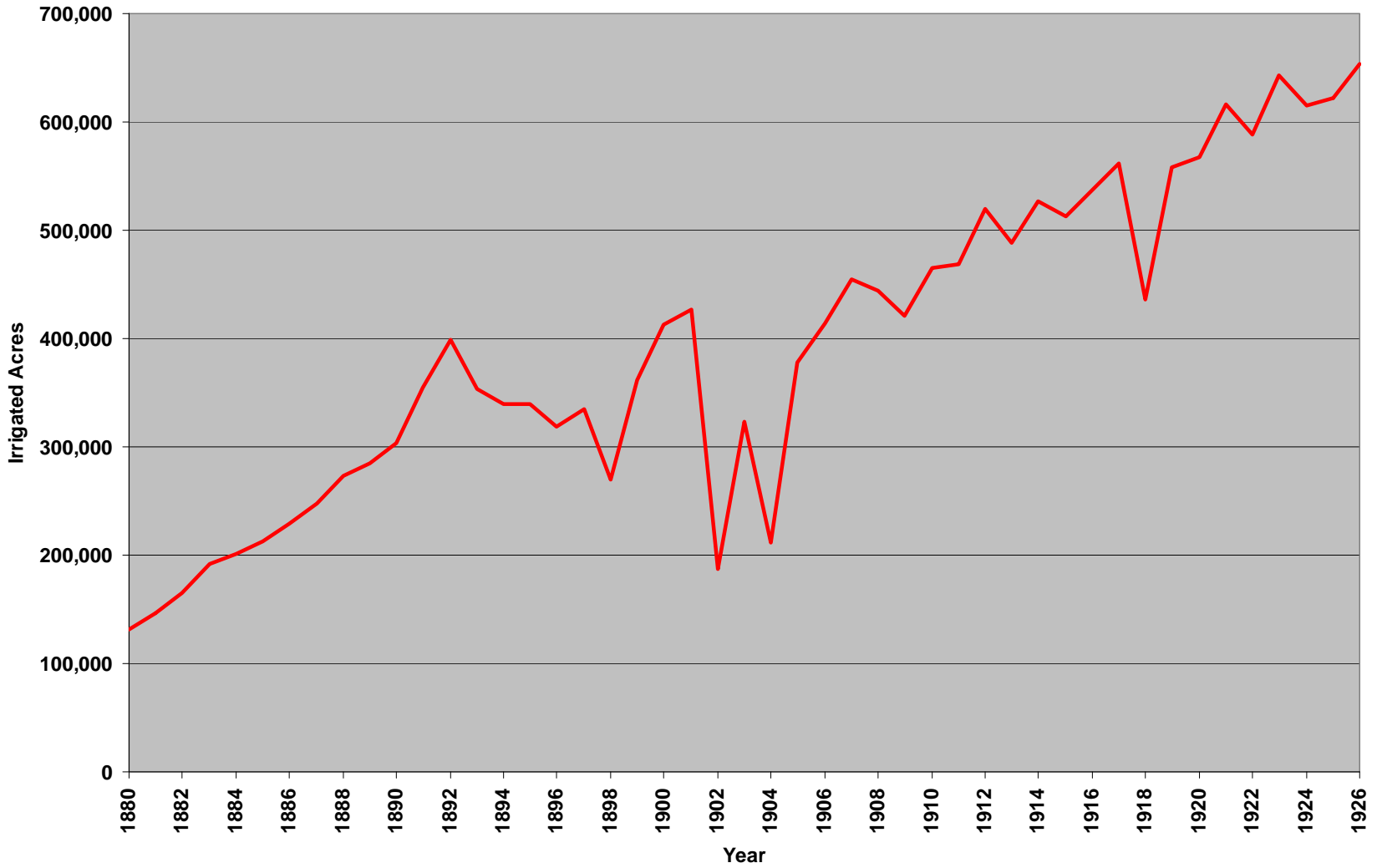
# Outline

- Prior to construction of El Vado
- Early history: 1935-1950
- The year everything blew up: 1951
- From drought to flood control: 1952
- Article VIII: 1953
- Typical Pueblo water operations
- Continued drought: 1960's
- Light at the end of the tunnel: 1970's
- Record high river conditions: 1980's

# Prior to Construction of El Vado

- Increase in San Luis Valley, Colorado agricultural development to 650,000 acres (roughly the same as today)
- El Vado was to be operated as a supplemental supply for natural flows of the Rio Grande for the Middle Rio Grande Conservancy District
  - Store water during spring runoff, thunderstorm inflows
  - Release water during summer months to alleviate shortages
  - Minimizes but does not eliminate water shortages
- El Vado is a post-Compact reservoir—built after 1929

## Development of Irrigated Acreage, San Luis Valley, Colorado, 1880-1926



Numerical Data From Preliminary Report on Middle Rio Grande Valley Investigation -- New Mexico, Debler E.B. and Elder, C.C., Denver, CO, December 15, 1927.

# Prior to Construction of El Vado

Time Up to	Acres Under Irrg.	Acres Failed	Remarks
1600	25,555		Indian development
1700	73,580		Indian with Spanish
1800	100,380		Above with Spanish grant
1850	123,315		Natural increase
1880	124,800		Transcontinental traffic and civil war demand, completed developments
1896	50,000	74,800	Due to short water supply, rising water table, RR supply competition and RR labor demand
1910	45,220	79,580	Further shortage and further rising water table
1918	47,000	77,800	War period
1925	40,000	84,800	Estimated present condition

# Prior to Construction of El Vado

- “1663-71 A severe drought struck Pueblos and Spaniards, resulting in little or no crop production, livestock losses, and human fatalities. . . .” Scurlock p. 47
- “1752 The Rio Grande was dry for almost 400 miles (border to border), primarily due to drought.” Scurlock p. 50
- “1879 The Rio Grande below San Felipe was dry for 1 or 2 months.” Scurlock p. 62
- “1895-1907 The Middle Rio Grande was dry during irrigation seasons” Scurlock p. 67
- “1908 The Rio Grande was dry just below Cochiti Pueblo” Scurlock p. 70

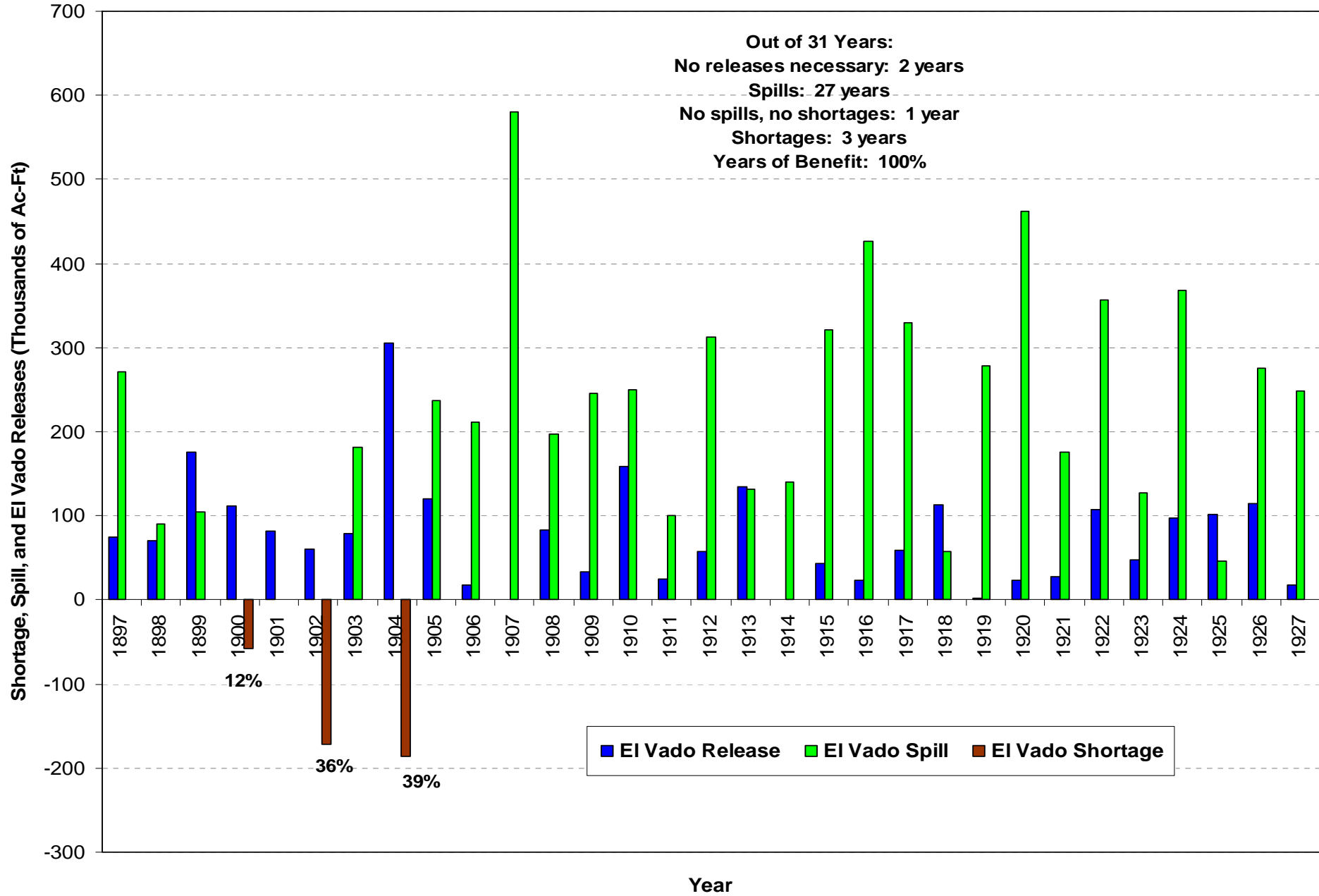
Quotations from From the Rio to the Sierra: An Environmental History of the Middle Rio Grande Basin, Scurlock, Dan, USDA Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-5, Fort Collins, Colorado, 80526, May 1998.

# Prior to Construction of El Vado

- Hydrologic study of El Vado operations by Debler and Elder, Appendix A in The Official Plan of the District--Assumptions
  - Supply assumed from 1897-1927 corrected for Colorado “present day” depletions
  - El Vado operated for project area of 123,265 acres (includes all irrigated non-Indian lands, Indian Newly Reclaimed lands, Indian Prior and Paramount lands)
  - Rio Grande Compact effects not included



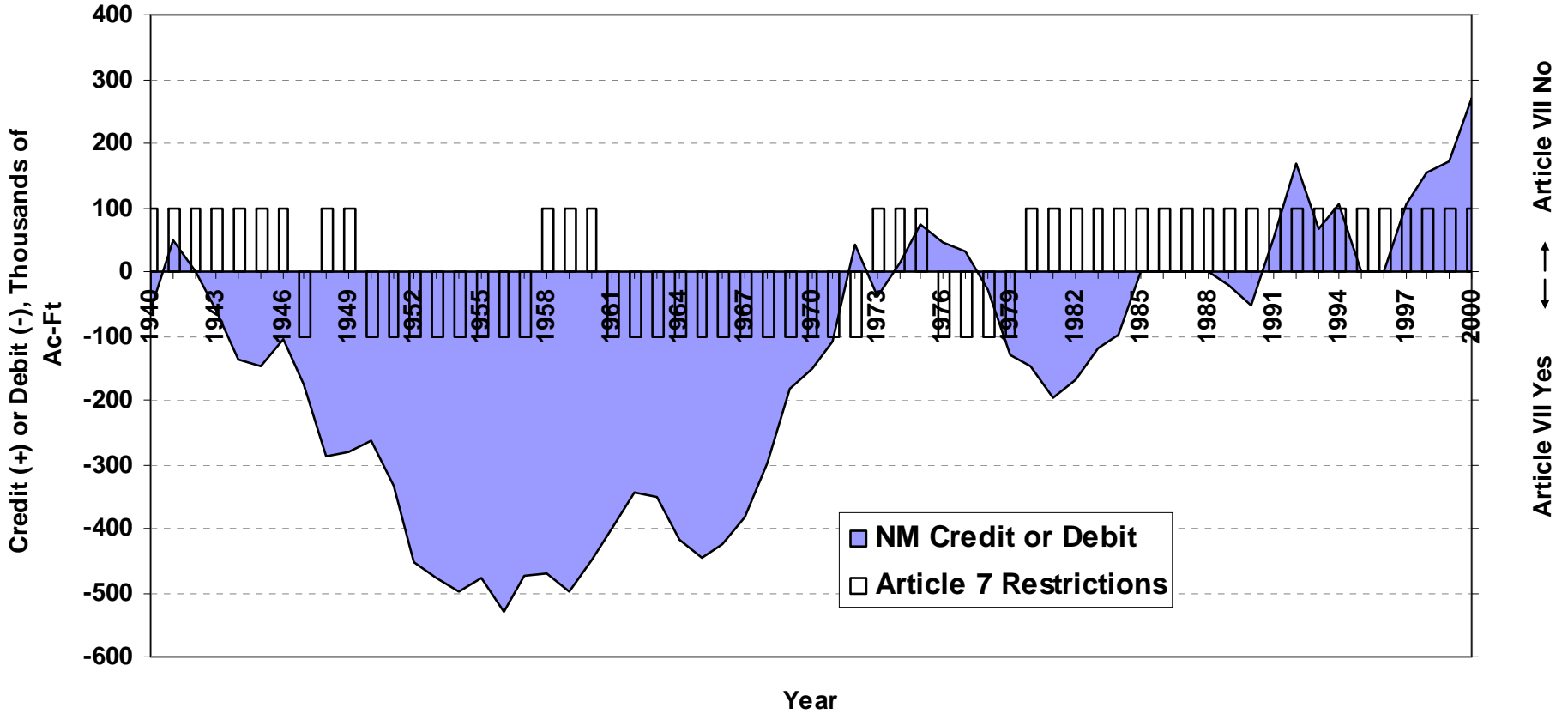
# Debler and Elder 1928 Hydrology Study, El Vado



# Prior to Construction of El Vado

- Actual El Vado supply
  - Debler and Elder assumed average Otowi supply 1897-1927: 1,288,000 ac-ft per year
  - Long term (1895-2004) average Otowi supply: 959,000 ac-ft per year
- Compact restrictions apply

# New Mexico Compact Restriction Status



# Early History, 1935-1950

- The District made a conscious decision that the Pueblos would benefit from storage in El Vado for Prior and Paramount lands in 1935, the first year of operation.
- With the advent of Compact accounting in 1940, it is possible to reconstruct El Vado operations and Compact restrictions from 1940 forward.

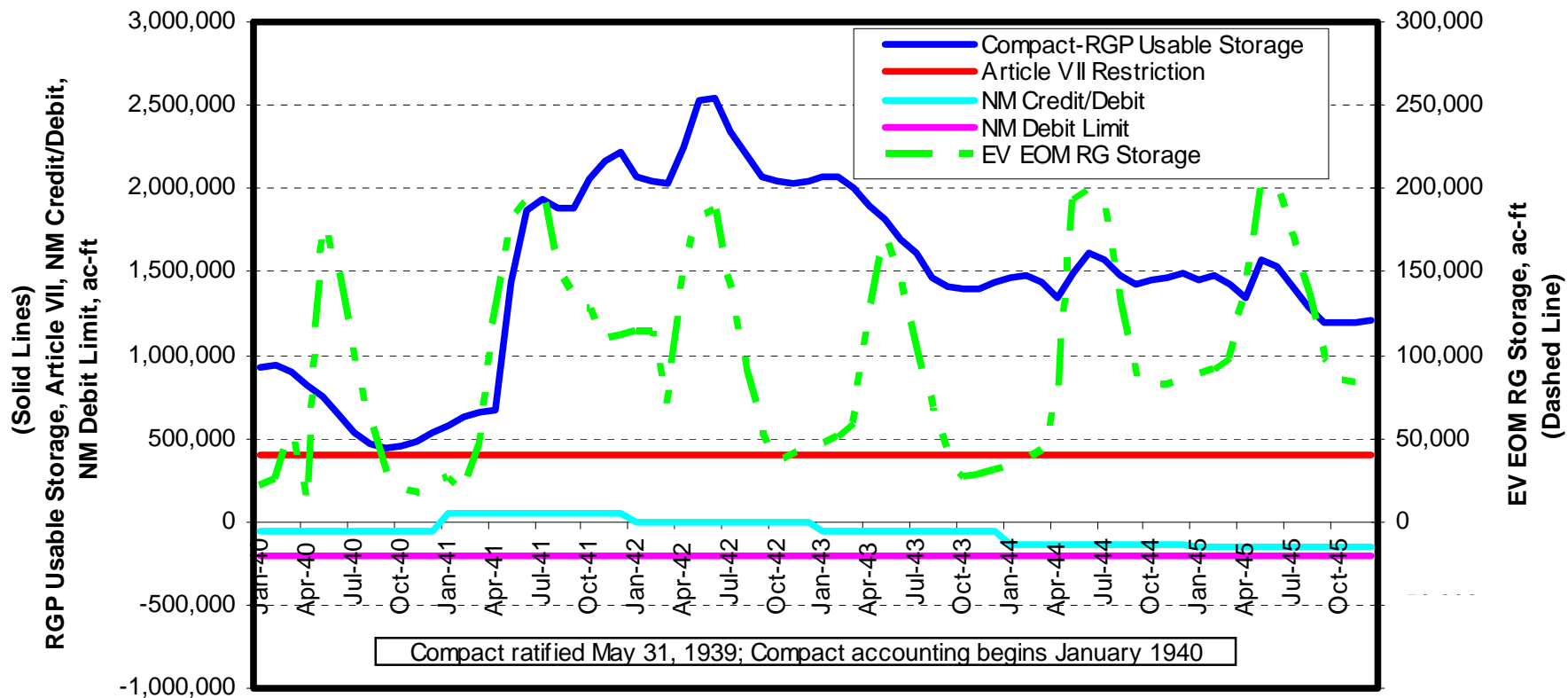
# Early History, 1935-1950

- Post-Compact reservoir restrictions simplified
  - Storage
    - Article VII: If usable Rio Grande Project storage in Elephant Butte and Caballo is less than 400,000 acre-feet, storage is not allowed in Colorado or New Mexico reservoirs constructed after 1929 (post-Compact reservoirs) except if caused by hold-over storage.
    - Usable Rio Grande Project storage can be computed daily and upstream pre-Compact reservoir restrictions can begin immediately.

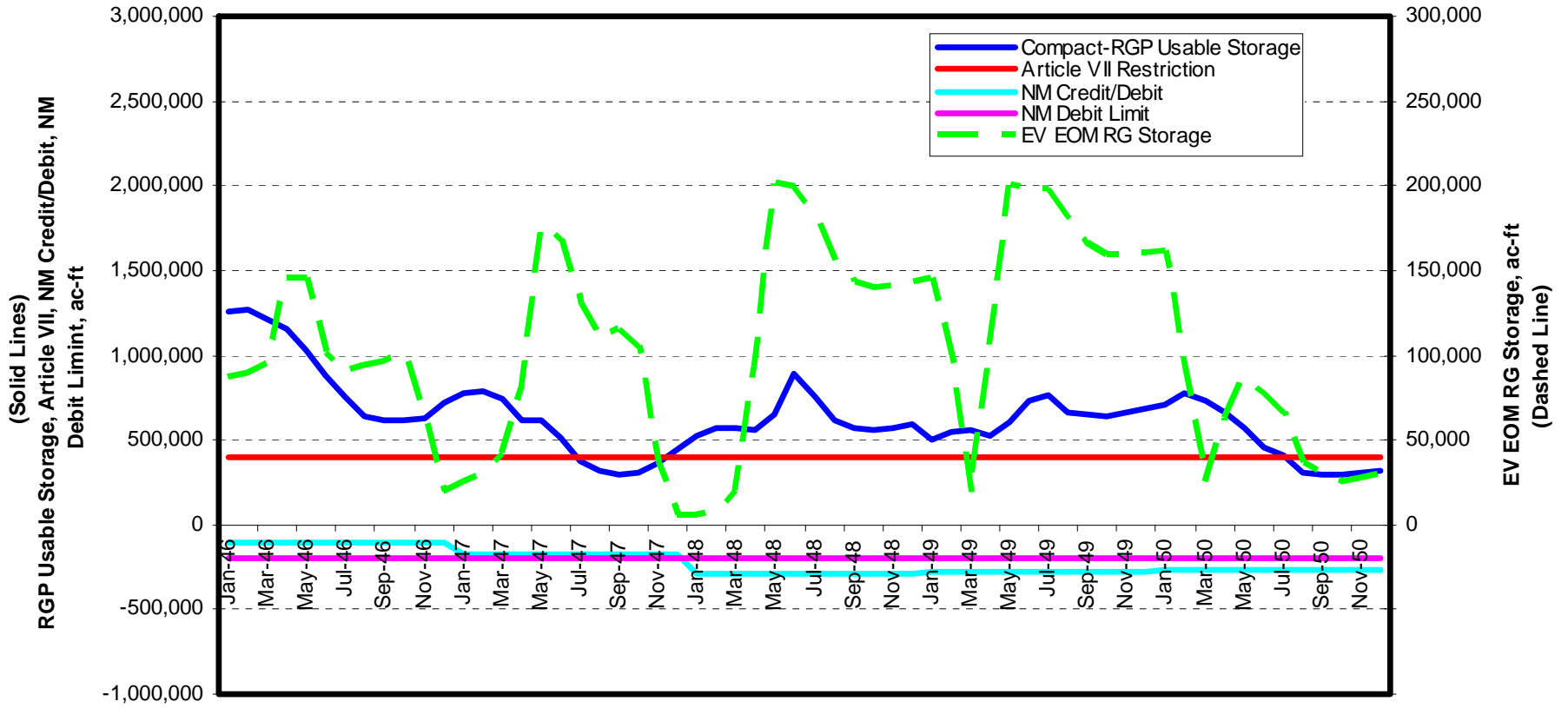
# Early History, 1935-1950

- Post-Compact reservoir restrictions simplified
  - Debit
    - Article VI: New Mexico's accrued debit limit is 200,000 ac-ft.
    - Article VI: Within the physical limitations of storage capacity in post-Compact reservoirs, NM shall retain water in storage at all times to the extent of its accrued debit.
    - Article VIII: During January, the Texas Commissioner may demand of NM the release of water from post-Compact reservoirs to the amount of the accrued NM debit to bring the quantity of usable water in Rio Grande Project storage to 600,000 ac-ft by March 1<sup>st</sup> and to maintain this quantity in storage until April 30<sup>th</sup>.
    - Debit is computed after the calendar year is over and is made official at the Rio Grande Compact meeting in the spring of the next calendar year. The computation is done annually and the debit computed for the year ended is observed the next calendar year.

### El Vado Rio Grande Storage and Compact Conditions 1940 - 1945



### El Vado Rio Grande Storage and Compact Conditions 1946 - 1950

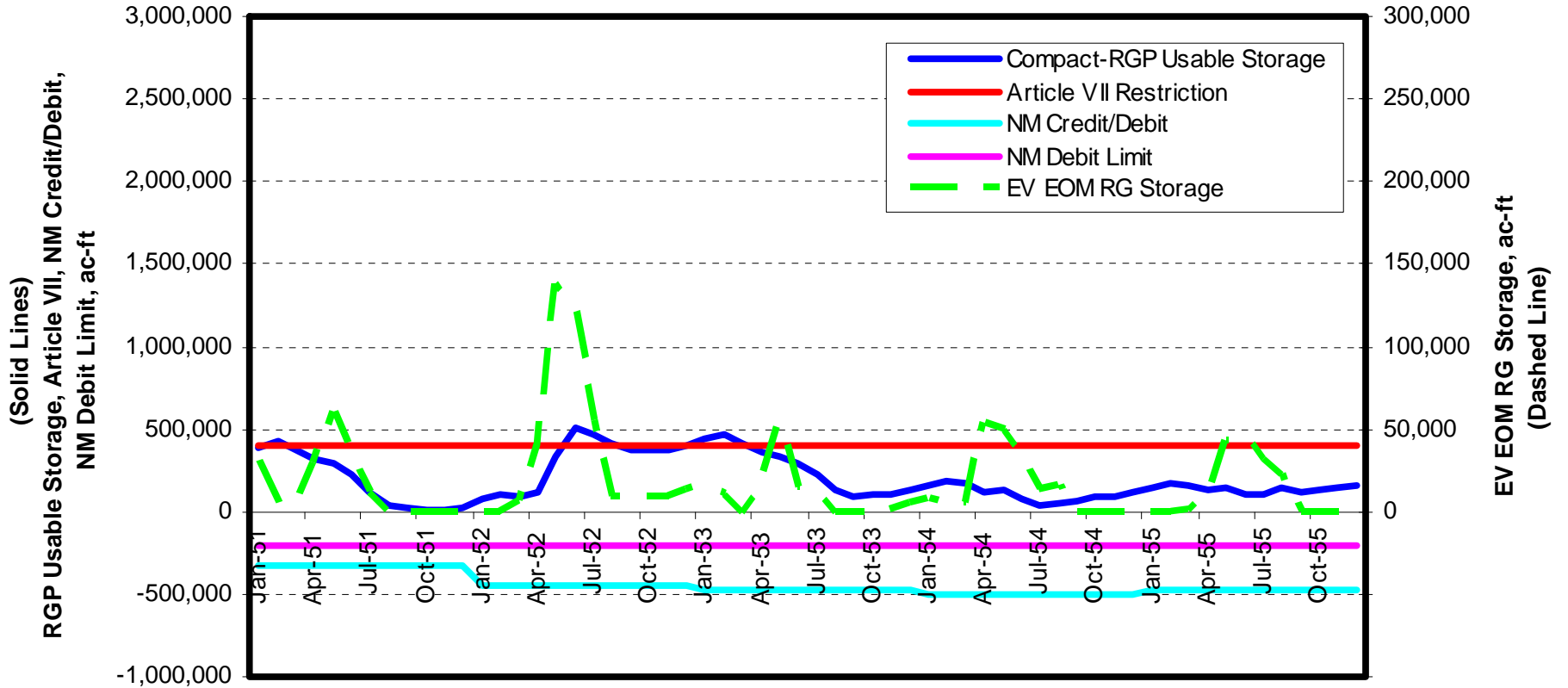




# The Year Everything Blew Up: 1951

- New Mexico has exceeded its Article VI debit limit of 200,000 ac-ft
- Article VIII restrictions apply—Texas calls for stored water (about 5,000 ac-ft)
- New Mexico is in Article VII restrictions—no more storage can take place
- Therefore, the gates of El Vado are to be opened and remain open.

## El Vado Rio Grande Storage and Compact Conditions 1951 - 1955



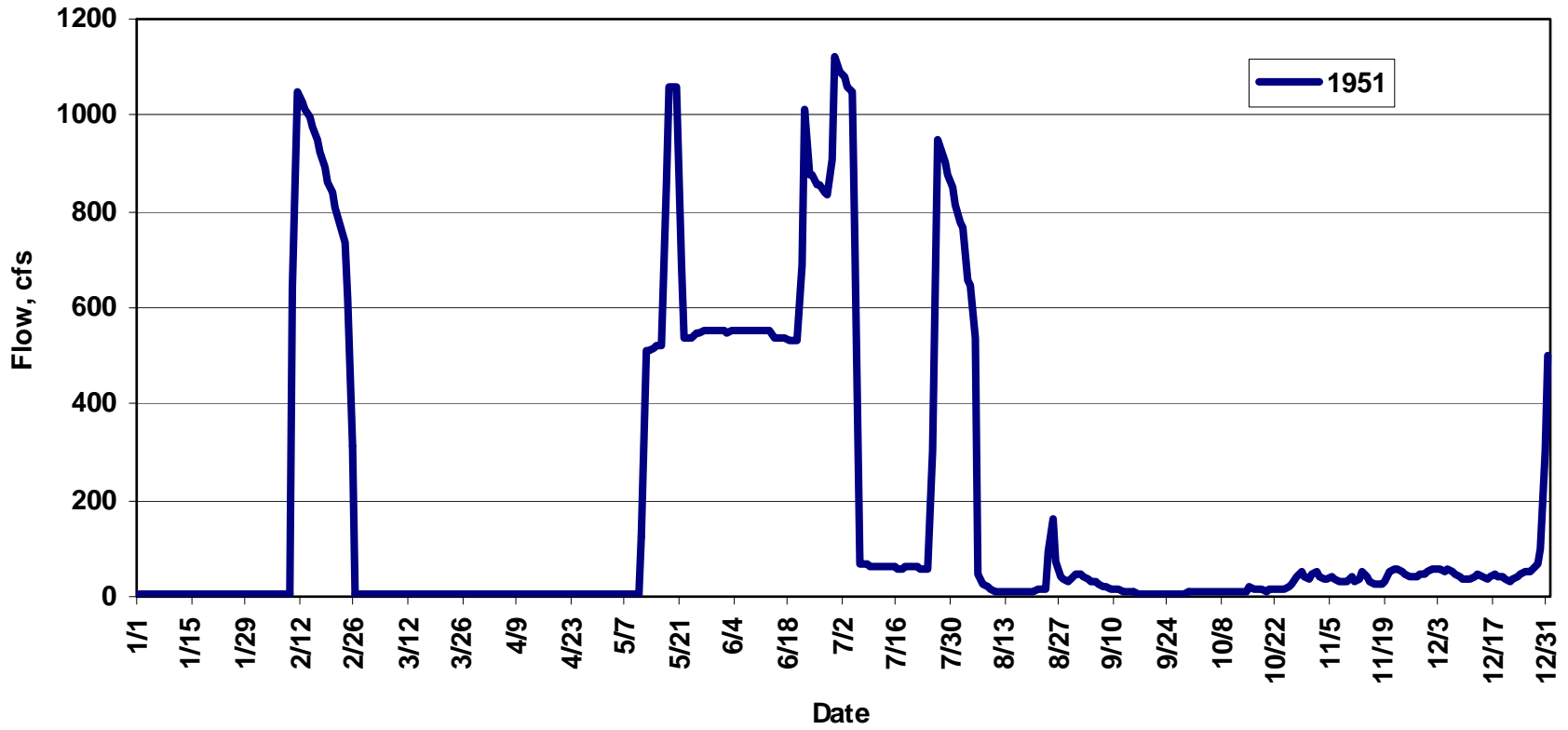
# The Year Everything Blew Up: 1951

- Pueblos react (newspapers 2/27/51; Pueblos 2/28/51)
- State Senate reacts
- NM State Game and Fish protests (Elliot Barker is State Game Warden)
- Editorials
  - Sense that Pueblos, irrigators are senior to the irrigators of a 40-year old Reclamation project because they had been irrigating for centuries.
- Pueblos appeal to Secretary of the Interior for action 3/16/51
- Secretary of the Interior Oscar Chapman requests that the Compact Commission change its mind, laying out his arguments that the Compact doesn't apply to the Pueblos 3/27/51

# The Year Everything Blew Up: 1951

- Compact Commission refuses 4/12/51 special meeting
  - M.C. Hinderlider is the Colorado state engineer and Compact Commissioner
- MRGCD refuses to take immediate action because of possible damage to El Vado outlet works from ice (this was April 12)
- Chapman asks MRGCD to store and release for Pueblos
- MRGCD agrees to Chapman's request
- NM State Engineer John Bliss tries to persuade MRGCD otherwise 5/3/51 letter, 5/26/51 MRGCD Board meeting
- By the time Pueblo storage had taken place and the ice was off the outlet works (in June), MRGCD had stored over 60,000 ac-ft

# 1951 USGS Below El Vado Hydrograph



# The Year Everything Blew Up: 1951

- It seems that the District operated El Vado for the benefit of all its members, non-Indian and Indian alike.
- Information from the BIA directing the amount to store and a schedule for release during the early part of the summer for the Pueblos has not been found.
- On July 20, 1951, BIA Area Irrigation Engineer A.W. Fife met with MRGCD Chief Engineer Hubert Ball to discuss a rotation plans.
  - Rotation
  - Huge losses between Angostura and Isleta in the river
  - One or two more irrigations from storage for Isleta
  - Some Pueblos were experiencing serious shortages, were in danger of crop loss
  - Pueblos came up with North-South rotation

# The Year Everything Blew Up: 1951

- Texas wasted no time and sued New Mexico and MRGCD in the Supreme Court in the October 1951 term. The Supreme Court agreed to hear the case, which became Texas v. New Mexico Original, No. 9.
  - A special master from St. Louis was appointed
  - Texas at one point agreed to the Pueblos' right to storage
  - The suit was never decided on its merits because the United States was ruled an indispensable party. Texas tried to get Congress to force the US to join the suit but failed.

# The Year Everything Blew Up: 1951

- Controversy over the practice of Indian storage and releases without regard to Compact restrictions continues to this day.
  - EBID 1950's
  - Department of State 1950's
  - Jesse Gilmer, Texas Commissioner, 1970's



# From Drought to Flood Control: 1952

- Expected high runoff meant that storage at El Vado had to take place for flood control purposes, even though Compact restrictions were in place.
- The Texas Commissioner agreed to this only if MRGCD passes a resolution authorizing and directing the State Engineer of New Mexico to operate El Vado for all of 1952.

# From Drought to Flood Control: 1952

- MRGCD agrees to this with the following reservations:
  - Except for flood control purposes, the State Engineer is to operate pursuant to the Compact and the repayment contract between MRGCD and BOR
  - The State Engineer is to recognize the rights of the Indians pursuant to Article XVI and the repayment contract between MRGCD and BOR
  - “This resolution shall not become effective unless and until consented to in writing by the Secretary of the Interior...”

# From Drought to Flood Control: 1952

- At MRGCD Board meeting 7/8/52, Pueblos want to know how MRGCD is going to handle storage and releases for the Indians.
- Letter from State Engineer on Article VI restrictions, stating that gates at El Vado should remain shut
- MRGCD states their contractual obligations to the Pueblos and US Government and Article XVI—they will operate El Vado for the Indians

# From Drought to Flood Control: 1952

- Snafu in transmitting Pueblo resolution for storage and release to Washington.
- Although resolution was done in March, it was not acted on until late June.
- Looks like delay going from BIA Albuquerque to Washington

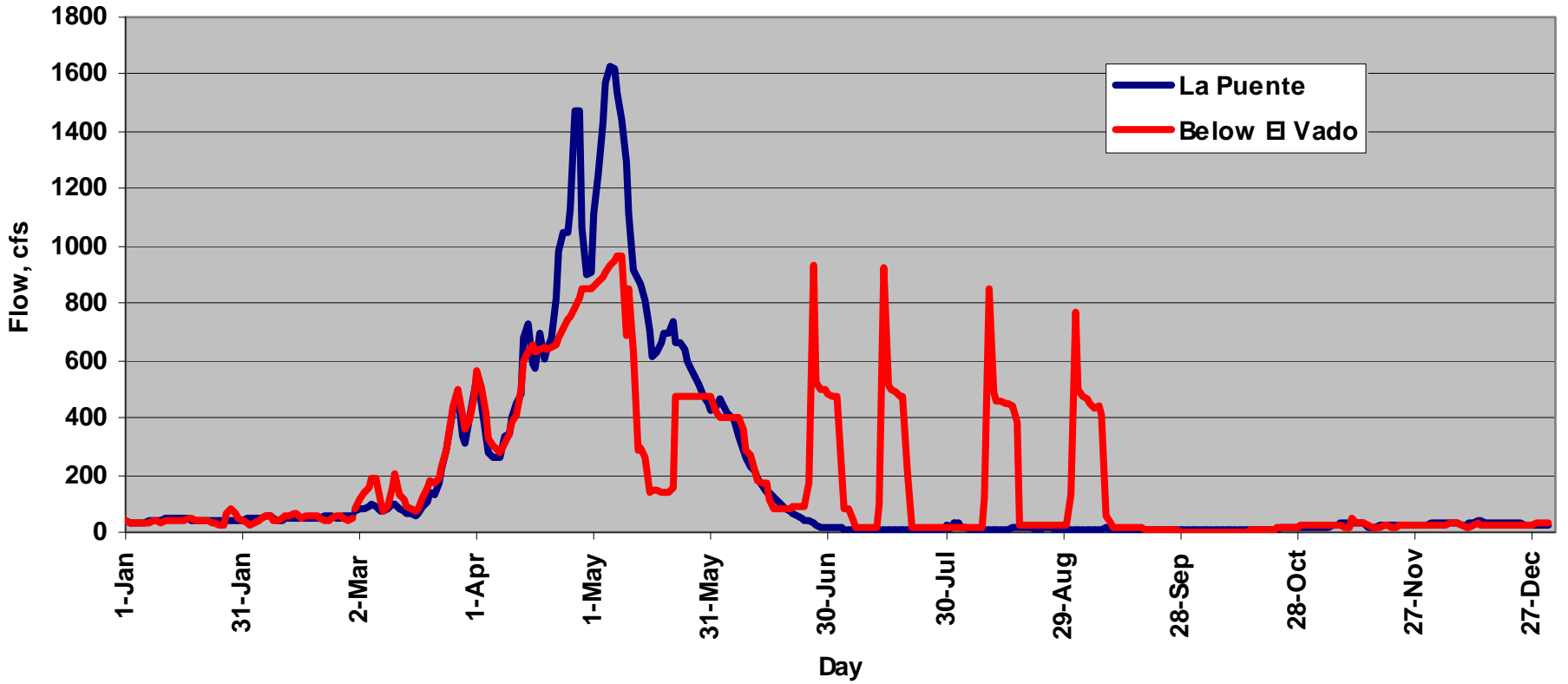
# Article VIII: 1953

- February 2, 1953 letter from Texas Commissioner Louis Scott requesting release of water from El Vado under Article VIII
- MRGCD agrees and releases water
- MRGCD stores again during the spring runoff

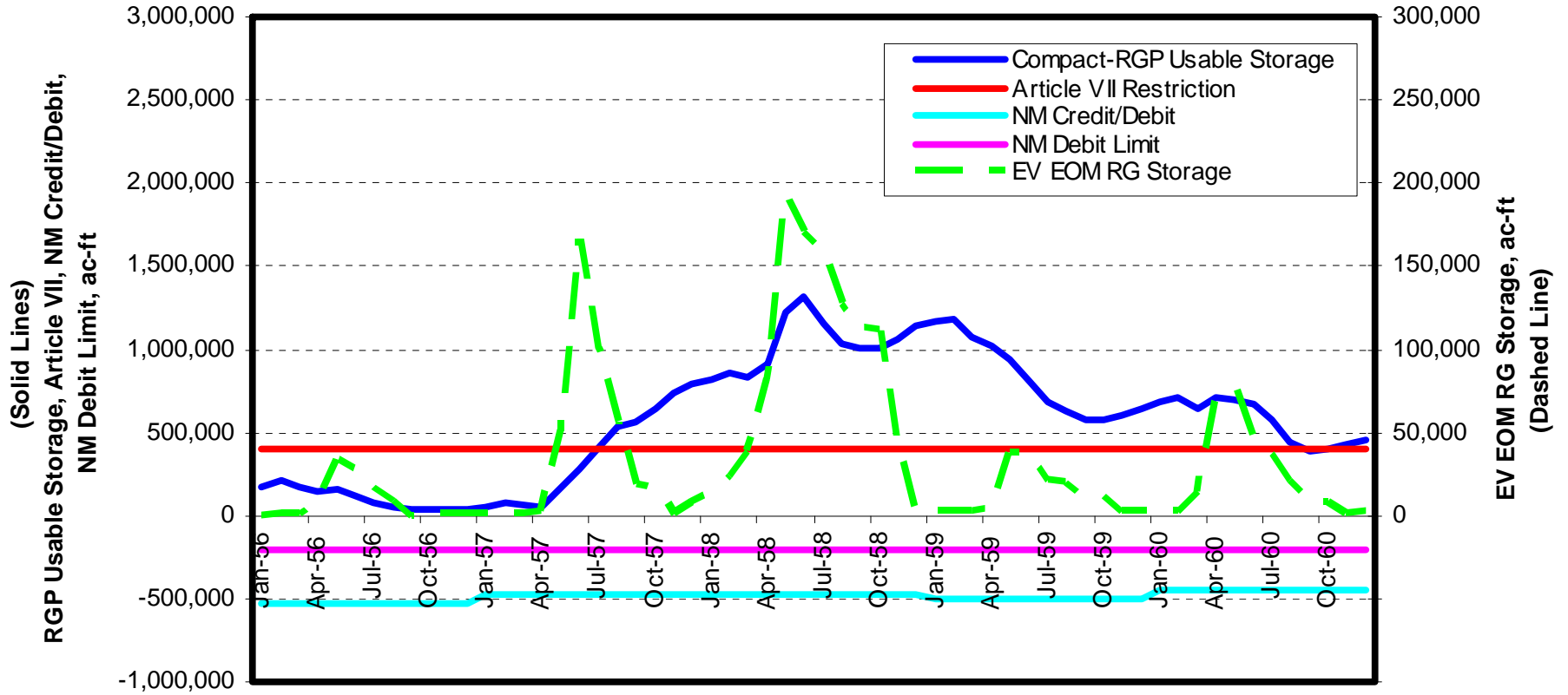
# Typical Pueblo Water Operations

- Pueblos sent letter to Department of Interior requesting sufficient storage and releases for upcoming irrigation season. Letter sent from December of previous calendar year up to March of current irrigation season.
  - Letter deliberately vague, with no quantities for storage or releases
- Interior sent letter requesting storage and releases to MRGCD
  - Usually included acreage. Minimum: 9,000 acres, Maximum 13,000 acres
- MRGCD sent letter to Reclamation directing sufficient storage and releases for Pueblos
- Later in the spring, usually, the Pueblos issued a “call for water”—directing releases to satisfy their needs, and if necessary, the releases were to be made from El Vado.
- Releases from El Vado were often block releases
- Dependent on natural flow, water conservation practices, rotating, scheduling.
- Pueblos occasionally directed timing and size of block releases.
- Feds would often initiate release

# 1956 Hydrograph



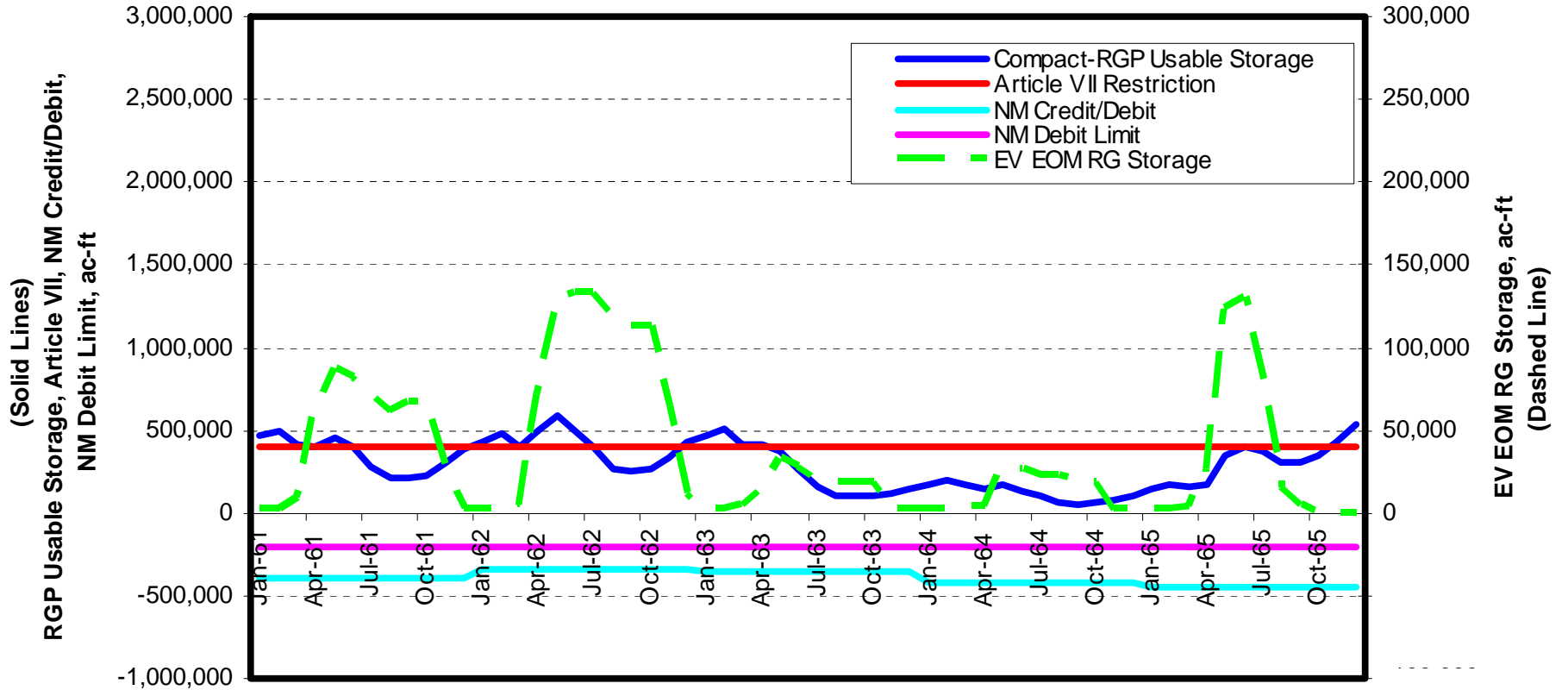
## El Vado Rio Grande Storage and Compact Conditions 1956 - 1960



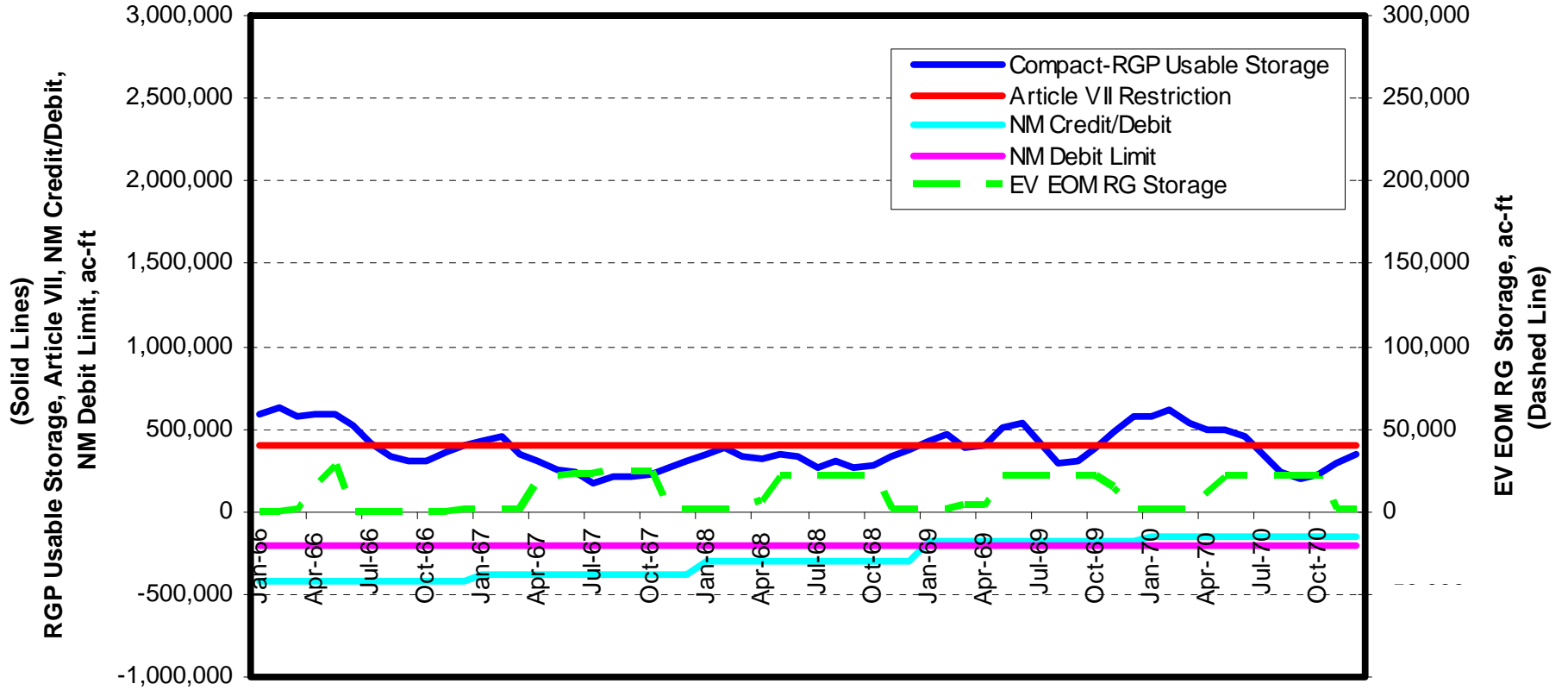


# Continued Drought: 1960's

## El Vado Rio Grande Storage and Compact Conditions 1961 - 1965

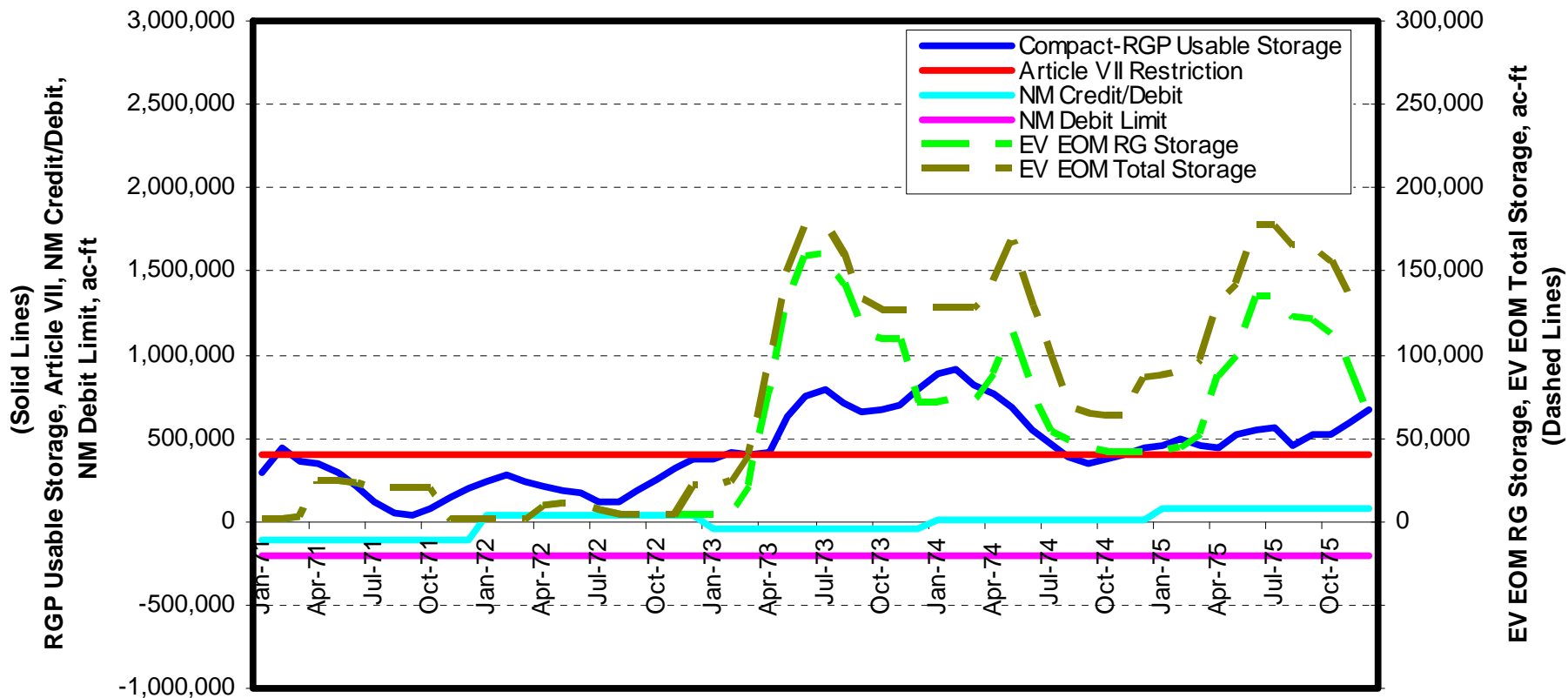


## El Vado Rio Grande Storage and Compact Conditions 1966 - 1970

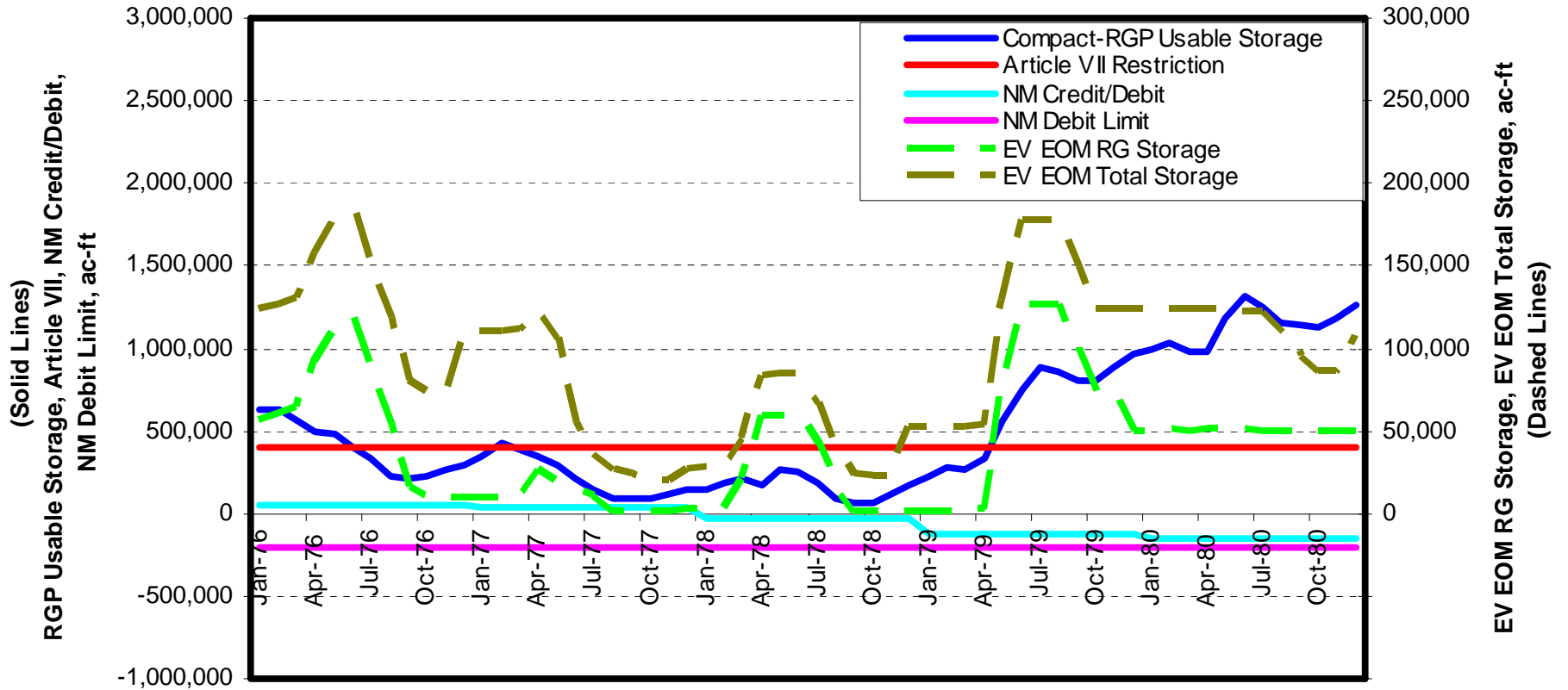


Light at the End of the Tunnel: 1970's

## El Vado Rio Grande Storage and Compact Conditions 1971 - 1975

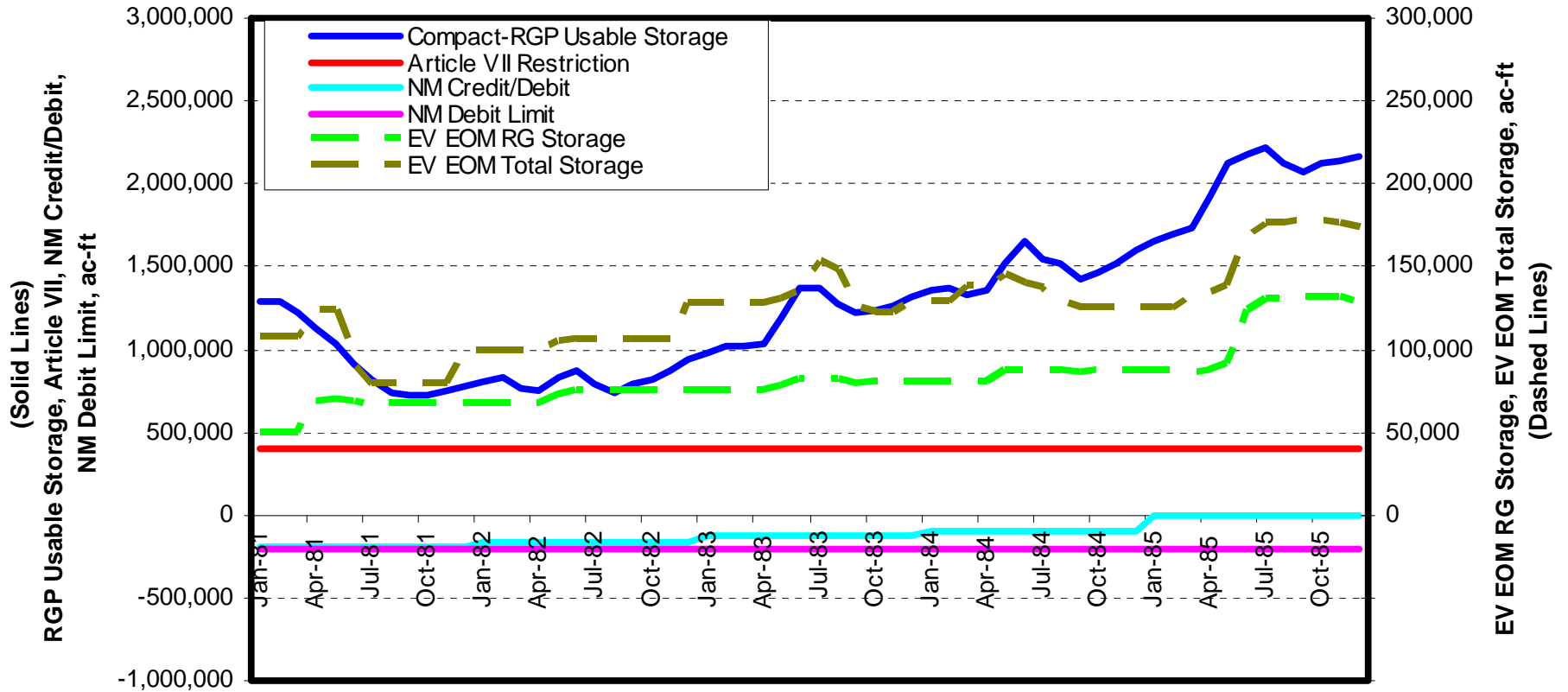


## El Vado Rio Grande Storage and Compact Conditions 1976 - 1980



Record High River Conditions: 1980's

## El Vado Rio Grande Storage and Compact Conditions 1981 - 1985





### El Vado Rio Grande Storage and Compact Conditions 1986 - 1990

