


6-2008

Abiquiu Reservoir Present and Future

Andrew Lieuwen, Ph.D.

Water Resources Division, ABQ-Bernalillo County Water Utility Authority

Follow this and additional works at: https://digitalrepository.unm.edu/utton_pubs

 Part of the [Administrative Law Commons](#), [Agriculture Law Commons](#), [Environmental Law Commons](#), [Food and Drug Law Commons](#), [Indian and Aboriginal Law Commons](#), [International Law Commons](#), [Land Use Law Commons](#), [Litigation Commons](#), [Natural Resources Law Commons](#), and the [Water Law Commons](#)

Recommended Citation

Lieuwen, Ph.D., Andrew. "Abiquiu Reservoir Present and Future." (2008). https://digitalrepository.unm.edu/utton_pubs/19

This Presentation is brought to you for free and open access by the The Utton Transboundary Resources Center at UNM Digital Repository. It has been accepted for inclusion in Publications by an authorized administrator of UNM Digital Repository. For more information, please contact amywinter@unm.edu.

Abiquiu Reservoir Present and Future

Our water. Our future.

A photograph of a sunset over a body of water, likely a reservoir. The sun is low on the horizon, creating a bright orange and yellow glow. The water reflects the light, and there are silhouettes of birds in flight across the sky. The overall mood is serene and hopeful.

Andrew Lieuwen Ph.D.
Water Rights Manager, Water Resources Division
Albuquerque-Bernalillo County Water Utility Authority



Presentation Overview

- Background
 - ◆ Abiquiu Reservoir Data/Purpose
- ABCWUA Usage
 - ◆ DWP Permit Conditions/Agreements
 - ◆ How Abiquiu will be used to meet OSE Conditions
 - ◆ Early Operation
 - ◆ Long Term



Abiquiu Background

Stats

- Constructed by COE in 1963
- Total *Potential* Storage – 1,500,000 ac-ft
- Flood Control Storage – 545,000 ac-ft
- Congress Authorized SJC Storage (1981) – 200,000 ac-ft
(*within the Flood Control Storage Volume*)
- ABCWUA SJC Capacity – 170,900 ac-ft

Purpose

- Designed and operated for flood and sediment control
- Generally operated at below 200,000 ac-ft



Abiquiu Background, cont.

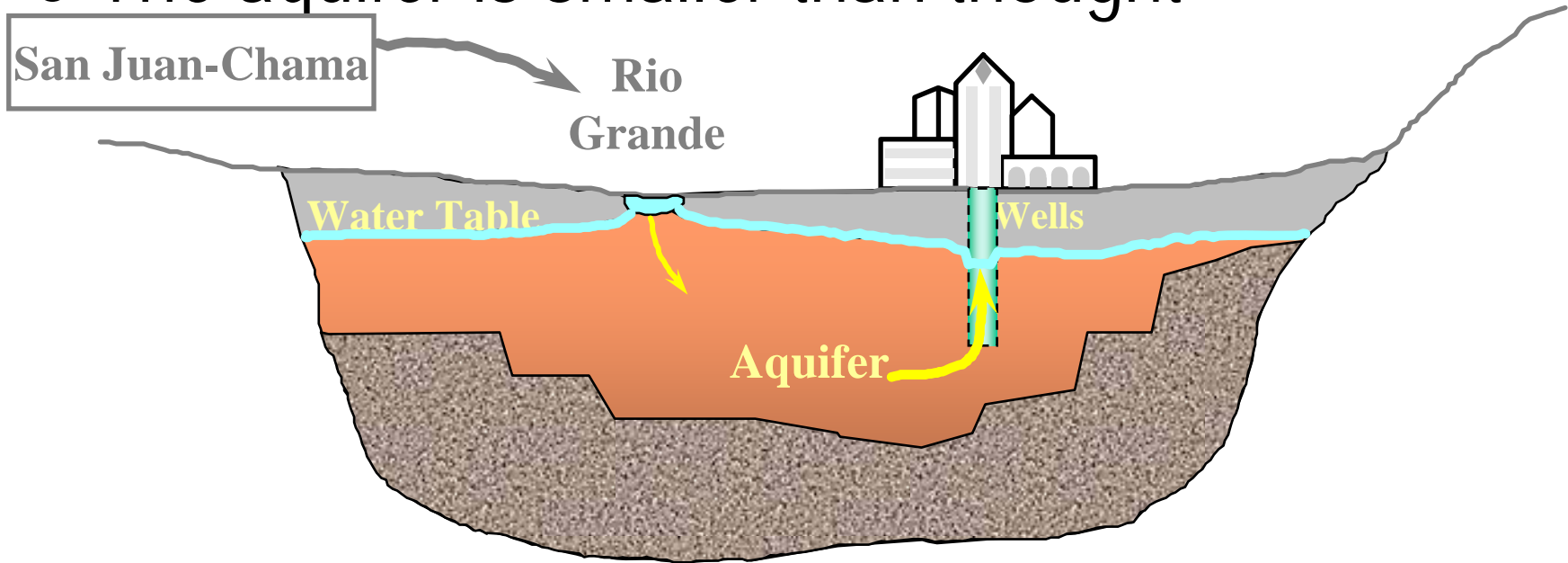
◆ Potential Storage

- ◆ The reservoir *could* be operated to accommodate additional storage but there are obstacles including:
 - ◆ NEPA process required to store native Rio Grande water
 - ◆ Native storage will be subject to the Rio Grande Compact
 - ◆ Property located in right of way



Problems with the 1960s Plan

- The Rio Grande does not re-supply the aquifer to extent previously thought
- The aquifer is smaller than thought



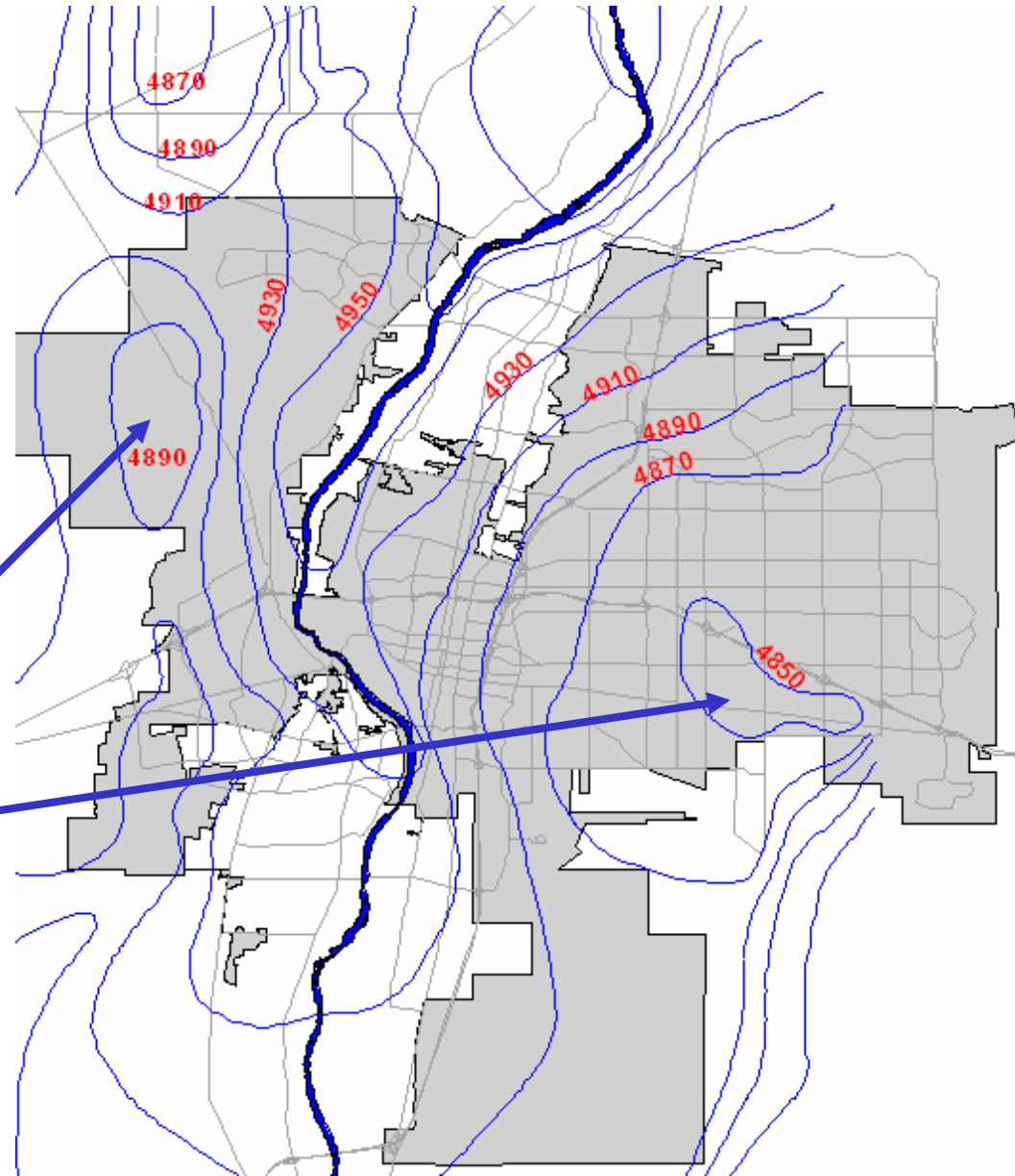


WATER RESOURCES STRATEGY IMPLEMENTATION



Albuquerque Ground- Water Levels Show Huge Declines

**Pumping Cone
of Depression in
2002**

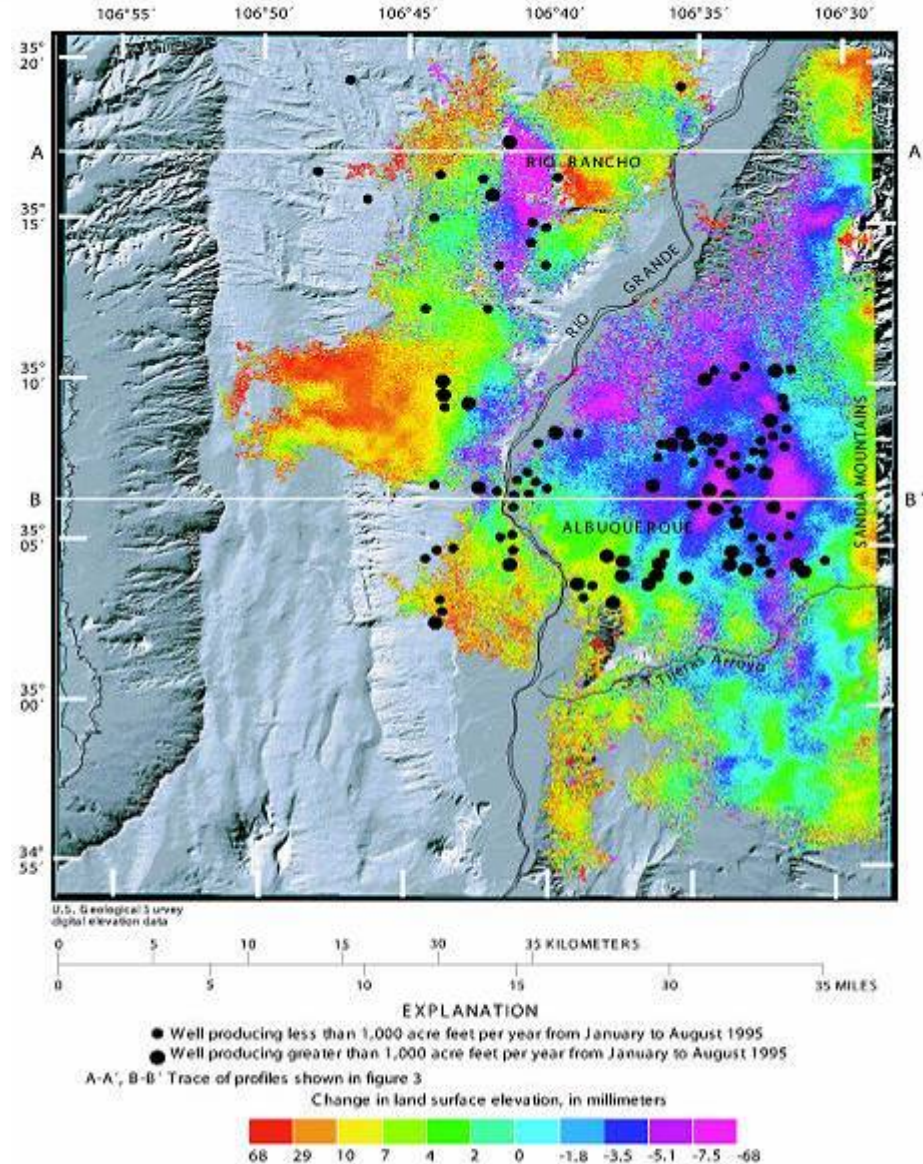




WATER RESOURCES STRATEGY IMPLEMENTATION

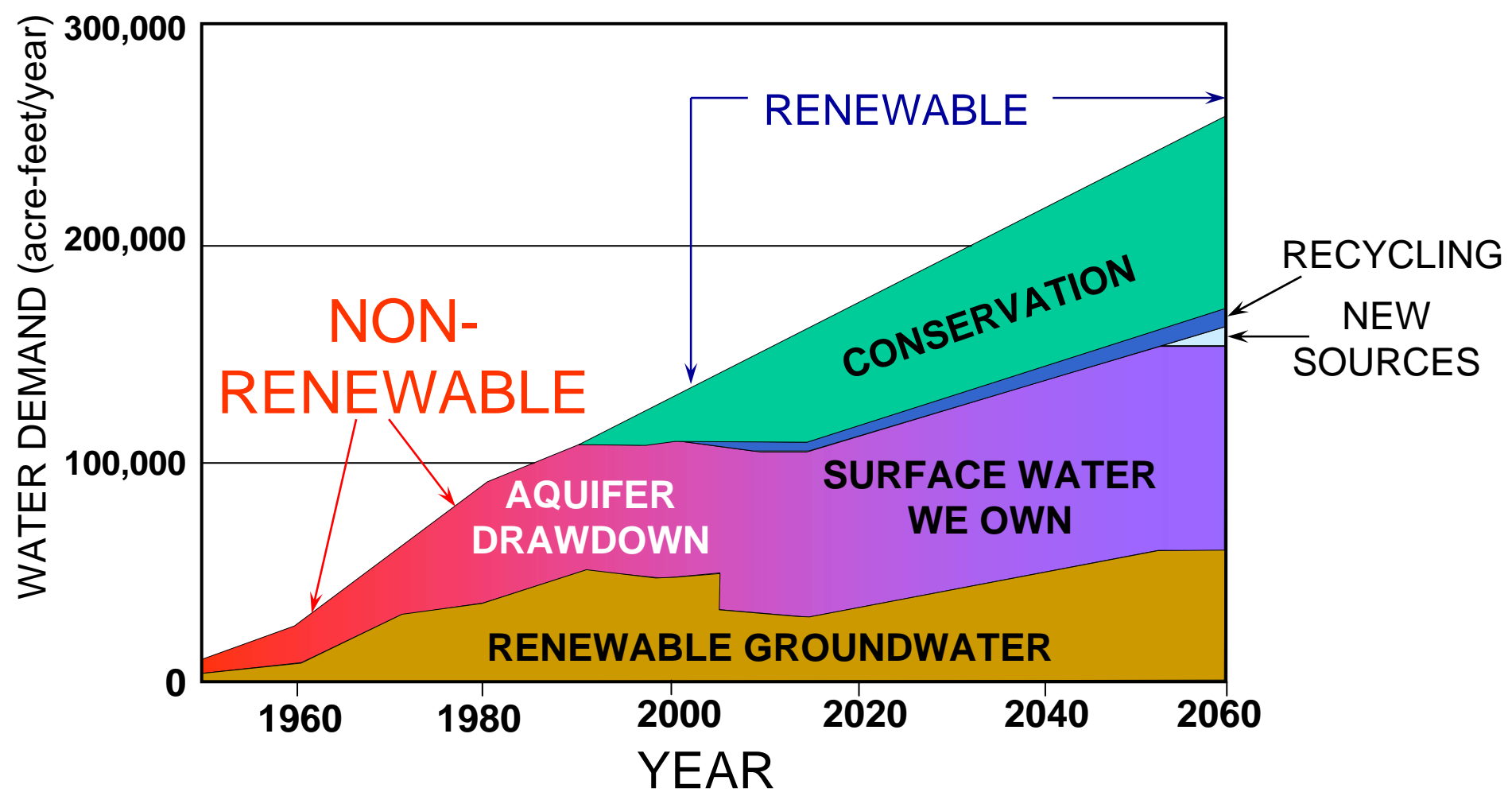


USGS - Land Surface Subsidence Estimate





WATER RESOURCES STRATEGY IMPLEMENTATION



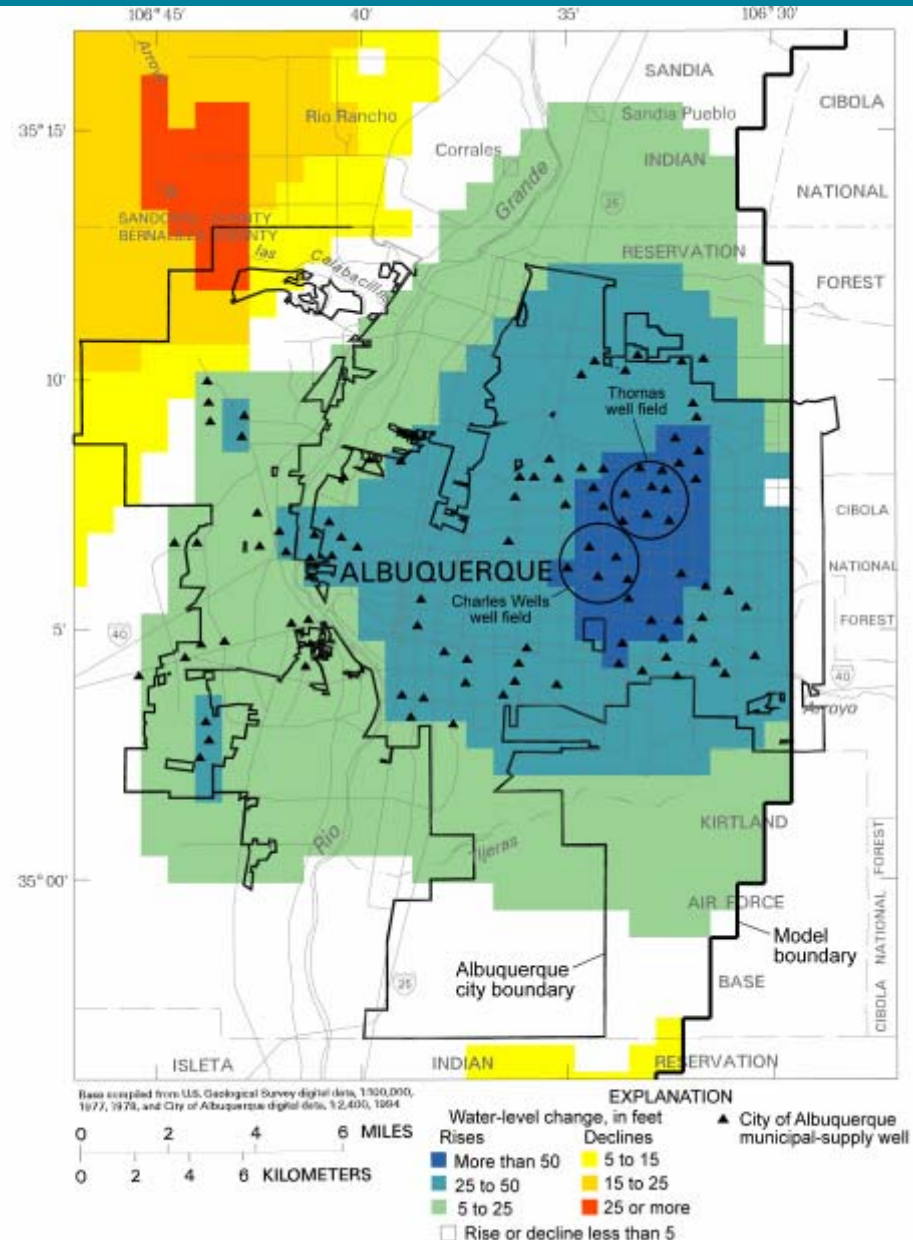


WATER RESOURCES STRATEGY IMPLEMENTATION



Restoration of Water Levels

- Water-Level Change from 2000 through 2040



Simulated water-level change in the production zone (model layer 5) in the Albuquerque area between 2000 and 2040.



OSE Permit Conditions

- Required to be at or below 175 gpcd prior to first diversion
- Required to be at or below 155 gpcd 20 years after first diversion
- Required to have water stored to offset the residual effects of historic pumping
 - ◆ OSE Permit requires 130,000 ac-ft in storage prior to diversion
 - ◆ To ensure sufficient reserves, the Authority will fill Abiquiu prior to diversion – *Abiquiu storage is essential to meet permit conditions and keep the river whole*



Agreements and Potential Payback

- ◆ Storage Space
 - ◆ USBR "Supplemental Pool" – 20,000 ac-ft of space for supplemental water (expires this year)
 - ◆ could do short term leases of space with payment in water
 - ◆ RGSM Settlement – 30,000 ac-ft of space, if available
 - ◆ MRGCD – 50,000 ac-ft of space, if available (requires NEPA if native)
- ◆ Payback from Previous Agreements/Borrowing
 - ◆ 2000 Agreed Order
 - ◆ MRGCD – owes 22,500 ac-ft – payback period: 2007-2016
 - ◆ 2000 Supplemental Order
 - ◆ USBR – owes ~15,000 ac-ft
 - ◆ 2002 Settlement Agreement
 - ◆ MRGCD – owes 70,000 ac-ft – payback period: 2007-2021



What Storage is Required?

- ◆ In any year, the Authority cannot use Rio Grande water in excess of its water rights
 - ◆ Diverted Amount + Pumping Effect – Return Flow – Rio Grande Rights – DWP releases - *Additional SJC Releases from Storage* ≤ 0
 - ◆ Diverted Amount ~ Annual allotment of SJC
 - ◆ Pumping Effect – calculated based on historic pumping
 - in the early years of the DWP diversion, despite a dramatic reduction in pumping, pumping induced effects on the river remain high due to the large amount of historic drawdown
 - these effects may result in additional SJC releases greater than 20,000 ac-ft in the first years of diversion and will gradually diminish as the drawdown cone is filled



What Storage is Required?, cont.

- ◆ Storage at the beginning of the year must be sufficient to provide 1) DWP release and 2) required Additional SJC releases
- ◆ Because the DWP will use all annual SJC water each year, sufficient water must be in storage *in advance of diversion* to offset evaporation and to meet the Additional SJC Releases
 - ◆ The Authority will fill Abiquiu prior to diversion to meet permit requirements and establish reserves
- ◆ Additional SJC Releases were calculated as part of the OSE Permitting Process to be about 100,000 ac-ft (when paybacks from agreements are released directly rather than stored). This calculation was based on an assumed hydrology. The actual requirement will be calculated on a year to year basis from actual pumping over time.
 - ◆ Actual releases will be calculated, but could be higher or lower depending on actual pumping and hydrologic conditions
- ◆ In addition, the Authority would like to keep about 50,000 ac-ft in reserve...



Preparing for Diversion

- Current Authority storage in Abiquiu
 - ◆ ~125,000 ac-ft
- Annual inflow to Abiquiu
 - ◆ ~47,200 (w/ losses incurred)
- Annual Release
 - ◆ leases - ~1,800 ac-ft
 - ◆ NI-25 (nonpotable) – ~2,000-3,000 ac-ft
- *Abiquiu will be effectively full in 2006 or early 2007*



Early DWP Operation

- Maintain sufficient storage and reserves to meet offset obligations and provide a factor of safety for drought
 - DWP releases will be constant at about 66 cfs
 - Additional SJC releases will vary from year to year
 - The volume of additional SJC releases will likely go down over time- diminishing to zero in about 20 years
 - Releases related to the Rio Grande Compact will be coordinated with the OSE/ISC to maximize benefit
 - Releases related to effects on MRGCD may be exchanged with owed water

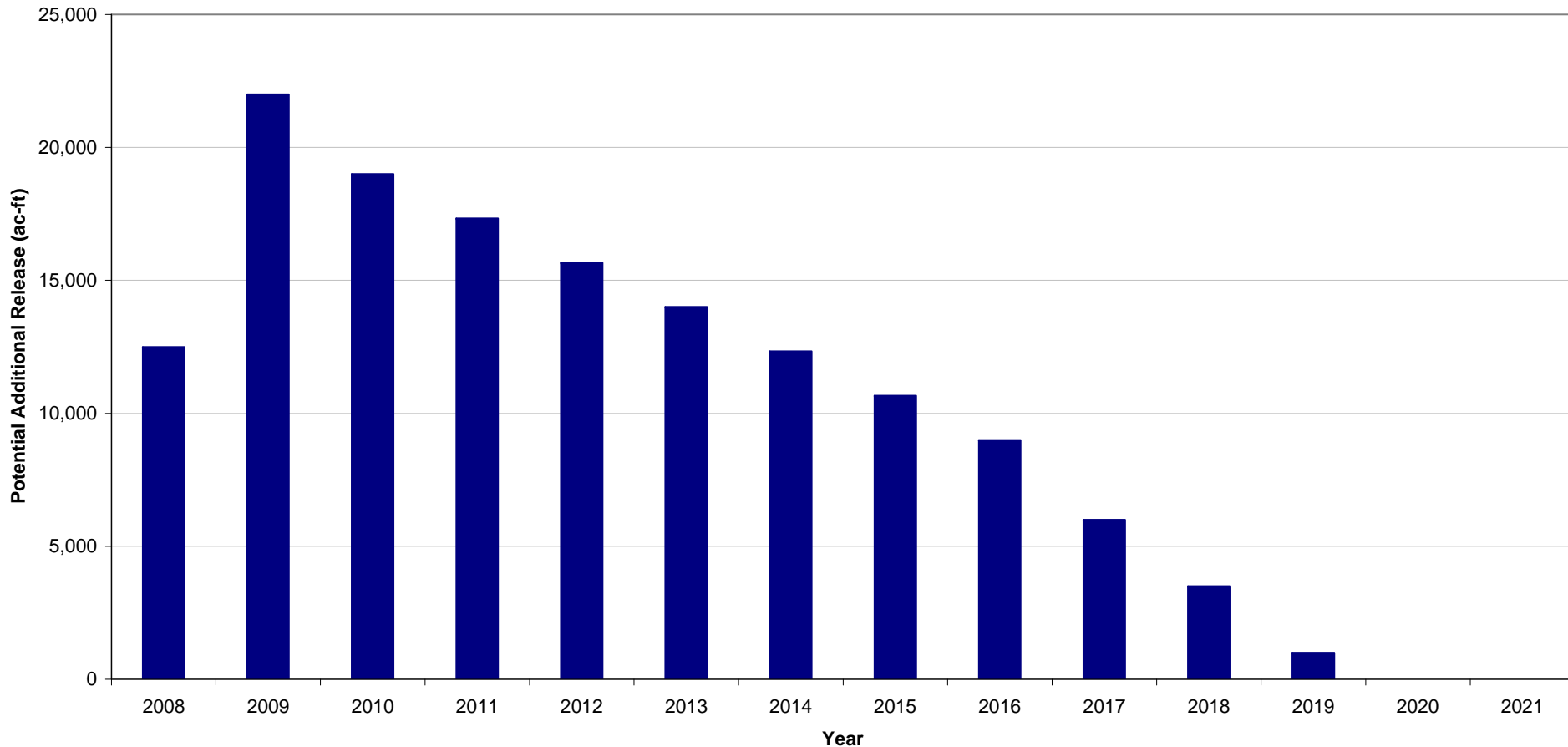


WATER RESOURCES STRATEGY IMPLEMENTATION



Potential SJC "Additional" Releases

SJC Additional Release

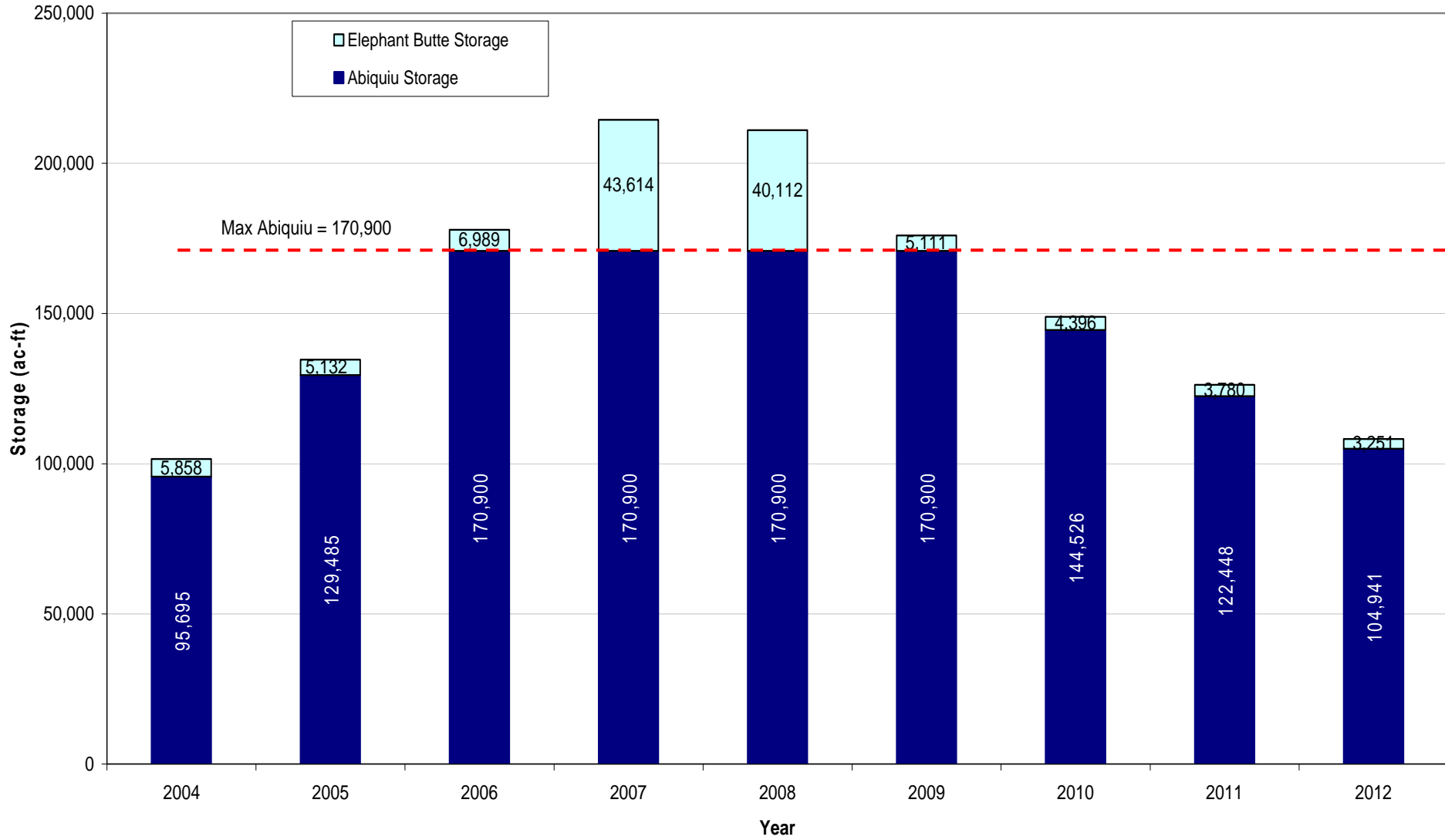




WATER RESOURCES STRATEGY IMPLEMENTATION



ABCWUA Potential Storage





Long-Term Operation – Storage essential to meet needs

- The Authority will attempt to maintain at least a 50,000 ac-ft reserve (i.e. be one year ahead of need)
- Drought years – Under the current permit, the DWP must cease diversion when flows in the Rio Grande reach a certain low flow threshold. Storage space will be required to hold SJC water not released due to drought conditions.
- Non-potable – Currently, the non-potable project is supplied with stored SJC water



Summary and Conclusions

- ◆ Authority storage in Abiquiu is required to meet permit conditions and keep the river whole
- ◆ Authority storage will be at more than two-thirds capacity in first 10 years of the DWP
- ◆ Authority storage will be used to provide long-term reserves and supply the non-potable project
- ◆ Depending on payback schedule, significant storage could be required hold water paid back to the Authority from previous agreements
- ◆ Agreements are in place to optimally use any available storage over time.
- ◆ Additional space could be created by expanding Abiquiu, but a number of issues would need to be resolved to complete