

Solving Water Needs in the Pecos River Basin

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The Pecos River Basin is located in southeastern New Mexico (see map). Water use in the basin is divided into several categories including agriculture, municipalities, industry, and interstate compact deliveries. Both ground- and surface water sources with rights of varying priority dates are utilized.

In 1948, New Mexico and Texas entered into the Pecos River Compact. In 1988, as a result of a lawsuit filed by Texas against New Mexico, the U.S. Supreme Court entered an amended decree, which appointed a federal river master and established an accounting methodology to verify state line water deliveries. Since 1988, New Mexico has struggled to maintain compliance with the compact and decree, which enjoin the state from defaulting on its annual obligation to deliver Pecos River water to Texas. New Mexico's failure to comply with the terms of the compact and decree could ultimately result in federal intervention, whereby the state would lose its ability to manage its water on the Pecos River.

Since 1992, New Mexico has had to aggressively lease water to meet its Pecos River Compact delivery obligations. However, leasing is an expensive, uncertain, and temporary solution. New Mexico continues to maintain a minimal state line credit but is in considerable danger of a net shortfall in the next few years due to the impact a wet year (such as 2004) has on a prolonged drought within the context of the compact accounting. Remedying a net shortfall has the potential to cause catastrophic economic and social hardship to the Pecos River Basin and the state through reduced economic activity (Whittlesey et al., 1993).

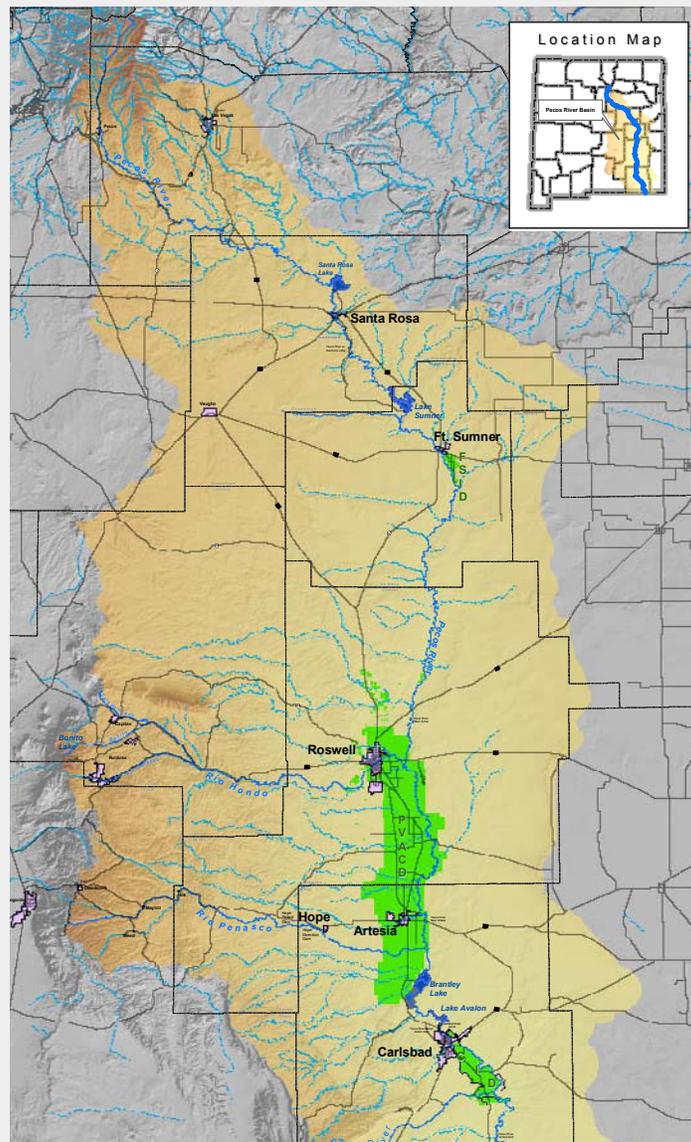
Consensus Building and the Settlement

In the summer of 2001, New Mexico was dangerously close to a possible net shortfall and feared that the only way to remedy the situation was through priority administration. Under priority administration, water rights holders have their water usage involuntarily curtailed until compact delivery requirements are met, from the most junior to most senior water right holder. Water curtailment is restored in reverse order once the delivery requirements are met.

The New Mexico Interstate Stream Commission (NMISC), the state agency charged with meeting interstate compact obligations, responded to this situation by creating an ad hoc committee of major stakeholders in the lower Pecos River Basin, including representatives from agriculture, ranching, industry, municipalities, and counties. The committee was charged with devising both short- and long-term consensus solutions to the Pecos River Compact delivery problem.

Despite complex and in some cases long-standing adversarial relations between some basin representatives, a consensus was reached on both interim and permanent solutions to the compact delivery problem. The committee presented its plan and a \$68 million funding request to the New Mexico Legislature.

The 2002 Legislature drafted legislation (NMSA 72-1-2.4) largely based upon the committee's plan and authorized the NMISC to use \$36.4 million to implement the statute, which ultimately provides long-term solutions to New Mexico's Pecos River Compact delivery obligations. Key components of the statute are: 1) achieving long-term compliance with the compact; 2) purchasing farmland and appurtenant water rights of varying amounts in the Carlsbad, Roswell, and Fort Sumner areas; 3) settling a 50-year old lawsuit, known as the Lewis Adjudication, between the Carlsbad Irrigation District (CID) and Pecos Valley Artesian Conservancy District (PVACD), prior to any purchases, with contractual agreement between all parties; and 4) establishing priority of purchases. Elements from the statute were later incorporated into a settlement agreement.



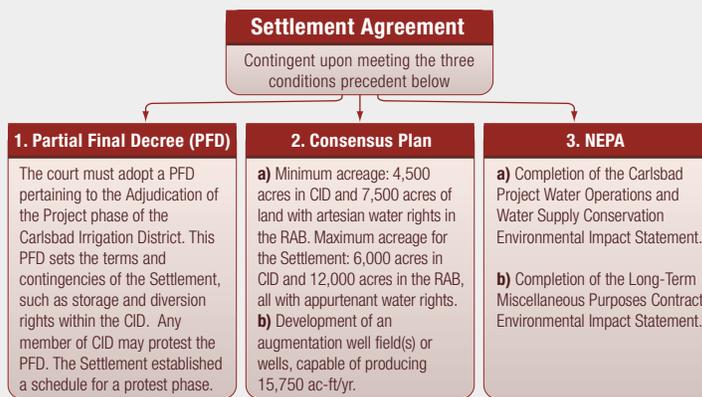
The Pecos River Basin in southeastern New Mexico.

In January 2003, the U.S. Department of the Interior, State of New Mexico, NMISC, CID, and PVACD entered into the Carlsbad Project Settlement Agreement (NMOSE, 2005). The settlement settles the project phase of the Lewis Adjudication, guarantees an annual water allotment of 3.697 acre-feet per acre to CID members, and establishes a schedule for delivery of water to the state line. Implementation of the settlement requires completion of conditions precedent (see diagram above), which include: entry into a partial final decree (PFD); implementation of the consensus plan, including land and water rights acquisition and developing an augmentation well field; and completion of federal National Environmental Policy Act (NEPA) requirements.

Hydrologic evaluations of the settlement indicate that its implementation would achieve long-term compact compliance by increasing water in both the Pecos River and the adjacent artesian aquifer, thus re-establishing hydrologic equilibrium. Long-term compliance with the compact would foster economic stability in the basin as well.

Implementation of the Settlement

PFD: Five formal protests to the PFD were filed with the District Court in conjunction with the settlement. Ultimately, three of the protests were resolved and the court ordered dismissal of the remaining two. The court's decision has been appealed.



Conditions precedent: the conditions that must be met before the Carlsbad Project Settlement Agreement becomes binding.

Consensus Plan Purchase Program:

In December 2002, the NMISC issued a request for bids, seeking offers from landowners interested in selling their agricultural land and water rights to the NMISC. Sufficient offers were received to meet the minimum settlement requirements.

Per statutory requirement, the NMISC developed a purchase price range based upon the offer prices and the specific characteristics of the land and water rights being offered within each area. These price ranges were much higher than originally projected in the financial request to the legislature, in part because of the legislative requirement to purchase the land in addition to appurtenant water rights but also because the state of New Mexico's entry into the market resulted in a significant shift in both the Roswell and Carlsbad areas to a market that favors sellers.

To date, the NMISC has negotiated purchase agreements totaling 3,080 acres in CID and 6,500 acres in the PVACD. At the time of the drafting of this article, a total of 673 acres in CID and 1,412 acres

in PVACD have been purchased. The NMISC will continue to close on agreements upon completion of due diligence for each transaction. Negotiations continue for additional purchase agreements, which will be contingent upon obtaining additional funding.

A land maintenance program is being developed for the purchased lands, which will include establishment and maintenance of existing vegetative cover to minimize wind erosion

and weed encroachment to maintain the land in accordance with applicable state and federal laws. Funding for this program was not contemplated in the original proposal to the legislature.

Consensus Plan Augmentation Well

Fields: The NMISC has begun developing primary and complementary augmentation well fields. Drilling at the primary well field, located in the southern Roswell Artesian Basin (RAB), commenced in

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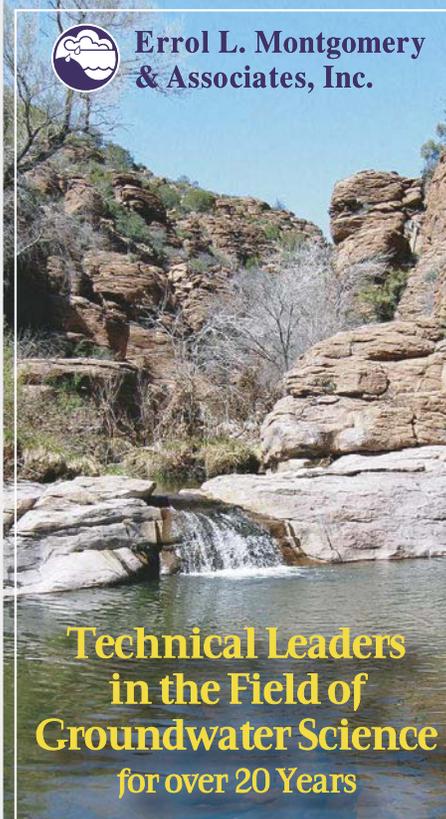


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located over buried drip-irrigation systems. Automated yield monitoring during harvesting is becoming common. Variable-rate application of soil amendments, fertilizers, and other inputs makes possible tighter management and control.

Even a uniform irrigation system with good control over the depth of water applied will not perform to its capabilities without good management. The Water Conservation Program at Westlands has worked for over 25 years to provide information to its water users that allows them to manage their allocations as efficiently as possible.

ET Data Help Determine Irrigation Volume

Real-time crop ET data specific to Westlands has been mailed weekly to all water users since 1978. Now the data obtained from the district's weather stations are faxed, e-mailed, and posted on the district's Web site daily. Originally, ET information was primarily used to facilitate irrigation scheduling, which had to be planned well in advance so the cumbersome irrigation equipment could be moved into place. But as drip systems were adopted and irrigation events became more frequent and easier to initiate, water scheduling has increasingly emphasized applying the proper amount of water rather than scheduling the date for the next irrigation.

In the 1980s, Westlands staff used neutron probe soil moisture monitoring data to develop specific crop coefficients for determining ET rates. However, satellite imagery is now available that provides a large amount of ET data at a minimal cost compared to earlier methods. Thus district staff today are utilizing 2003 and 2004 satellite imagery to develop and update crop coefficients in order to produce real-time ET rates. Farmers can determine how much water to apply to a particular crop on a particular day by using the ET measurements to calculate water lost from the root zone since the last irrigation, when the soil

was presumably saturated. This water balance approach helps prevent water loss to deep percolation while ensuring the crops receive sufficient moisture.

Satellite Imagery Used

Lack of uniformity in the irrigation system has always been compensated for by applying additional water so that drier parts of a field receive enough. Since 2003, however, Westlands has provided water users with satellite imagery on its Web site that can be used to identify areas of uneven distribution. The Normalized Difference Vegetative Index (NDVI) imagery provides a sensitive measure of the vegetative mass and water status of a crop and is usually available within three or four days from the date of overflight. With this information and investment in improved technology, issues of nonuniform distribution can be addressed.

District water users have found other uses for satellite imagery. Consider the tomato farmer in his field who receives a cellular telephone call from the cannery, saying that he must stretch out his deliveries. However, tomatoes spoil from water stress if not harvested in time. The farmer can log on to the district's Web site and look at the imagery for his field – which may be only a week old – and proceed to harvest first the parts of the field that are not expected to hold well.

Variable-rate application services for various agricultural inputs are being routinely offered by suppliers to water users in the district. Satellite imagery and yield monitoring are now being used to develop maps that guide variable application rates of soil amendments, fertilizer, growth regulators, and defoliants.

New technology is continually being developed to improve water-use efficiency in agriculture and elsewhere. Westlands provides information and data to its water users to help them take advantage of that technology.

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mid-April. The NMISC is finalizing details for the design of a complementary well field located in the middle RAB. Some water rights purchased will be transferred to the well fields.

NEPA: Two environmental impact statements (EIS) are being completed by the NMISC as a joint-lead agency with the Bureau of Reclamation. The Carlsbad Operations and Conservation EIS that proposes to re-operate Sumner Dam for the benefit of the Pecos bluntnose shiner fish will be completed in June 2006. The Long-Term Miscellaneous Purposes Contract EIS proposes to change Carlsbad Project water from irrigation to other purposes (in this case, state line delivery) and should be completed in March 2006.

Conclusion

As a result of signing the Carlsbad Project Settlement, adjudication costs have been drastically reduced and the adjudication process has been expedited. However, the settlement has not yet been fully implemented. Currently, it is estimated that an additional \$63.6 million will be required for full implementation. The settlement may ultimately fail if the funding to support the acquisition program is not provided. This may leave strict priority administration as the only means to remedy a net delivery shortfall. Priority administration will be costly, difficult, and highly contentious. It will require significant expenditures for administration, enforcement, and litigation with unpredictable and potentially disastrous results for Pecos River water users and the state of New Mexico.

Any opinions or positions expressed in this article are the authors' and do not necessarily represent the opinions or positions of the New Mexico Interstate Stream Commission or the state of New Mexico. Contact Rebecca King at rking@ose.state.nm.us or Elisa Sims at esims@ose.state.nm.us.

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