

THE HISTORICAL AND LEGAL FRAMEWORK

DECISION-MAKERS
FIELD CONFERENCE 2003
The Lower Pecos Region



Raising the gates at Lake McMillan, ca. 1895.



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The U.S. Supreme Court in an Original Jurisdiction Action *Texas v. New Mexico, No. 65 Orig. (Pecos River)*

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In 1948 New Mexico and Texas entered into the historic Pecos River Compact, and the negotiators were fully confident that the agreement would put conflicts between the states behind them. Only thirty years later, the states were before the U.S. Supreme Court to ascertain and enforce the meaning of the 1948 compact. Texas complained that New Mexico had failed to deliver all the water required by the compact. The Supreme Court eventually ruled in Texas's favor, requiring New Mexico to pay for past under-deliveries and issued a decree specifying New Mexico's obligations in the future.

THE PECOS RIVER COMPACT

After an unsuccessful attempt in 1925, New Mexico and Texas negotiated a compact in 1948 apportioning the Pecos River. The compact was approved by New Mexico and Texas in 1949 and ratified by Congress that same year. Although a water apportionment compact, the agreement is unusual in that it recognizes New Mexico's early uses but essentially guarantees Texas the same amount of water that it received in 1947 (the "1947 condition").

At least two major problems contributed to eventual litigation between the states over the compact. One problem is what has often been called the "failed critical assumption" underlying the compact. New Mexico was unduly optimistic about how much water could be salvaged by eliminating water-thirsty salt cedar from riparian areas. Between 1967 and 1975 the U.S. Bureau of Reclamation root-plowed 19,000 acres of salt cedar in the Acme-Artesia reach of the river, but there was no measurable increase in base flow attributable to the eradication program.

A second problem of the compact was its reliance on an "inflow-outflow" methodology that had been developed by an engineering committee at the time of the compact. In simplest terms, the methodology used water data records from 1919 forward to correlate river flows near Alamogordo Dam (now renamed Fort Sumner Dam) to river outflow at the New Mexico state line. This correlation became known as Plate No. 2, Senate Document 109, and was used by compact administrators (along with other provisions of an

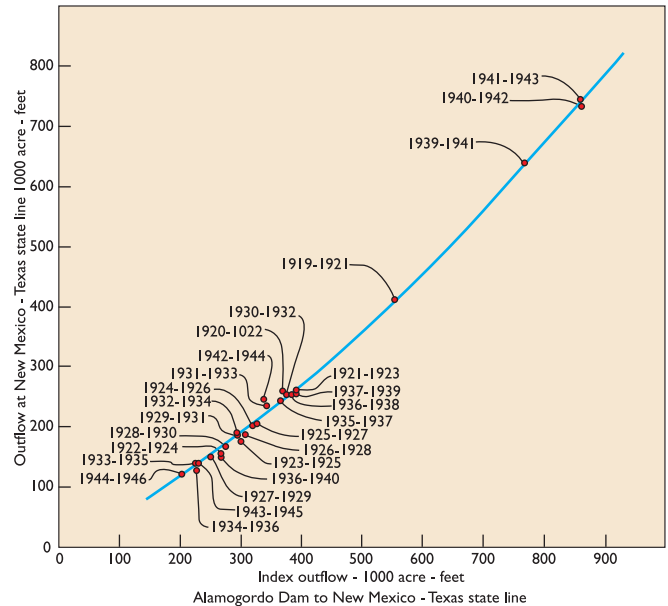


Plate No. 2 from the original Pecos River Compact, plotting inflow at Alamogordo Dam against mandatory outflow at the New Mexico-Texas state line.

inflow-outflow manual) to determine New Mexico's annual water delivery obligation under the compact.

Unfortunately, the inflow-outflow correlation was erroneous, "[f]or it became clear . . .," in the words of the U.S. Supreme Court, that "state-line flows were significantly below the amount that one would have predicted on the basis of the inflow-outflow manual, with no obvious change in either natural conditions along the river or in man's activities."

MAJOR LITIGATION EVENTS IN *TEXAS V. NEW MEXICO*

New Mexico and Texas bickered for years over the meaning and implementation of the "1947 condition," as used in the compact. Finally, Texas sought the U.S. Supreme Court's permission to commence an "original jurisdiction action." In 1975 the Supreme Court allowed Texas to file its complaint against New Mexico and appointed a Special Master.

After initial proceedings before the Pecos Special Master, the Supreme Court in 1980 affirmed the

Special Master's interpretation of the "1947 condition" (Article III(a) of the compact) to mean depletions due to New Mexico water uses that were in place in 1947, along with certain projected uses.

In 1987 the U.S. Supreme Court adopted the Special Master's calculation of a 340,100 acre-feet shortfall (for years 1950–83) and suggested that New Mexico repay the deficit over ten years with "water interest" for any bad-faith failure to deliver these additional amounts. At the same time, the Court entered the original decree and made certain provisions for its enforcement. New Mexico was ordered to comply with Article III(a) of the compact and to deliver water each year in an amount calculated according to the Texas version of the "inflow-outflow" equation. The Court also suggested that its decree might be modified once the river is better understood.

The Supreme Court entered an Amended Decree in 1988, as recommended by the Special Master, appointing a River Master, adopting the Pecos River Master's Manual (originally Texas trial exhibit no. 108), and specifying a water accounting procedure for verifying state-line water deliveries. Neil S. Grigg, a West Point civil engineer serving on the faculty of Colorado State University, was appointed as River Master. He continues to serve in this position.

In 1989 the Special Master conducted hearings on Texas's remedy. Three potential remedies were available to Texas: (1) specific performance, that is, the repayment of actual water; (2) monetary damages based on New Mexico's economic gain as the result of the under-deliveries; or (3) monetary damages based on Texas's economic loss as the result of the under-deliveries. A recovery in water would have meant an additional delivery obligation of 38,500 acre-feet per year for ten years—on top of New Mexico's average delivery obligation of 80,000 to 90,000 acre-feet per year. Although Texas argued for water, its actual aim appeared to be the recovery of the \$1 billion claimed to be New Mexico's illicit gain. Texas also offered evidence that its farmers had lost \$51 million in profits because of under-deliveries.

New Mexico countered these arguments with expert testimony that a water remedy would be extremely wasteful since, over the ten-year period of deliveries, Texas farmers would gain by \$2.5 million but New Mexico would lose \$85 million. New Mexico argued that a monetary remedy calculated on its gain would be appropriate only if New Mexico had been guilty of bad faith in withholding water. New Mexico's experts also testified that Texas farmers would have made only \$8 million in additional profits with the water under-delivered over thirty-five years.

The states eventually reached a settlement, approved by the Supreme Court in 1990. New Mexico agreed to pay \$14 million for past compact violations. Although the Court retained jurisdiction, the case was essentially over. As one of New Mexico's attorneys remarked shortly thereafter, "I think we won." Since 1991 little has happened before the Supreme Court.

ENFORCEMENT OF TEXAS V. NEW MEXICO AMENDED DECREE

The Supreme Court's Amended Decree (1988) provides a detailed water-accounting procedure for monitoring and verifying whether New Mexico has satisfied its obligations under the compact and the decree. The River Master supervises the process. The basic verification of state-line water deliveries is a three-year process:

- 1 Calendar Year 1 (Water Year)—Water is delivered to Texas at the state line.
- 2 Calendar Year 2 (Accounting Year)—River Master determines whether deliveries during Calendar Year 1 satisfied New Mexico's Art. III(a) obligation. If New Mexico has satisfied its delivery obligation for Calendar Year 1, the monitoring process for that year is complete. If New Mexico has under-delivered, the process extends into a third year, pursuant to an approved plan adopted by the River Master.
- 3 Calendar Year 3 (Compliance Year)—Before March 31, New Mexico must have complied with an Approved Plan to remedy any shortfall.

Recent Deliveries The compact and the Amended Decree provide that New Mexico must deliver to Texas approximately 45 percent of the flows past Alamogordo Dam (now Fort Sumner Dam) plus flood inflows between Alamogordo Reservoir (Sumner Lake) and the state line. From 1987 through 2000, New Mexico had maintained a positive balance in deliveries to Texas and had a cushion of more than 10,000 acre-feet going into water year 2001. Unfortunately, New Mexico under-delivered for five of these fourteen years and had razor-thin positive margins for three other years. Much of the accumulated credit results from large net deliveries in 1988 and 1992. The river is highly variable, year to year, but the recent trend does not favor New Mexico.

Proceedings In the Event of a Shortfall If New Mexico delivers all the water that was due in Calendar Year 1 by March 31 of Calendar Year 3, then any issue

concerning under-deliveries during Calendar Year 1 is put to rest. Of course, each calendar year commences a separate two- or three-year cycle of monitoring and compliance, and phases from separate years overlap.

New Mexico may not be able to deliver all the water that was due in the previous year. Under the Supreme Court's Amended Decree, New Mexico does not have to deliver sufficient water in all instances to meet the previous shortfall. Before March 31 of Calendar Year 3, New Mexico only must comply with the River Master's Approved Plan to remedy the shortfall—*whether or not sufficient water is actually delivered under the plan*.

Subsequent Proceedings It is uncertain how the Supreme Court will proceed if the River Master files a Compliance Report indicating New Mexico's noncompliance. Will the Court resolve any such motion based solely on the Compliance Report, and pleadings in response to the report, or appoint a new Special Master to conduct additional proceedings? Note that the Supreme Court has indicated it will give great deference to the River Master's determinations. The River Master's final determinations concerning the Final Report (accounting), Approved Plan, and Compliance Report will be subject to review by the Court only on a showing that the Master's determination was "clearly erroneous."

Decree Provisions of Texas v. New Mexico The Amended Decree in *Texas v. New Mexico* establishes the required state line deliveries as the senior right on the Pecos River system (with the possible exception of "federal regulatory water rights" under the Endangered Species Act). Additionally, the Pecos River Compact requires "in maintaining the flows at the New Mexico–Texas state line . . . New Mexico shall in all instances apply the principle of prior appropriation within New Mexico." This requirement for intrastate priority apportionment is New Mexico law by virtue of the State's ratification of the compact. This requirement is also federal law by virtue of the Law of the Union Doctrine—i.e., Congress's approval of the compact.

FUTILE CALL

In addition to the general reluctance of many states to strictly enforce priorities, there are exceptions to strict priority administration. For example, a priority call to curtail upstream junior uses is "futile" if water will not reach a senior's diversion because of channel losses or evaporation.

The leading futile call case is *State ex rel. Cary v. Cochran*, decided by the Nebraska Supreme Court in 1940. The court indicated that a senior call on the

Platte River would be futile where upstream juniors would cease to divert 700 cubic feet per second (cfs) to deliver 162 cfs to a downstream senior. The court indicated, however, that priorities will be enforced so long as water can be delivered in "usable quantities" to the senior. "Usable quantities" is a complicated factual issue, and the determinations of water administrators will be upheld unless unreasonable or arbitrary.

A variation of the futile doctrine is sometimes applied to ground water use when junior pumpers reduce the water table out of reach of the senior appropriator's well. Must all junior pumping cease in deference to the senior who may have a shallow well? Some state courts have held that the senior with an unreasonably shallow well cannot prevent the utilization of an aquifer by others. In Colorado "[t]he appropriate remedy may not be curtailment of well withdrawals. Rather, it may involve other management tools; for example, adjustment between users of the cost of drilling deeper wells . . . or the [responsible agency] may fashion additional management criteria."

The U.S. Supreme Court has also recognized the futile call doctrine where the call on the river by a downstream state would be futile. In *Washington v. Oregon* (1936), concerning the Walla Walla River, an original action was dismissed upon the Special Master's finding that Oregon's upstream diversions did not materially reduce water available to the Washington user. Washington had also failed to demonstrate by clear and convincing evidence that the injury would be of a serious magnitude.

In *Texas v. New Mexico*, New Mexico could attempt to invoke the futile call doctrine in proceedings before the River Master preceding the Approved Plan and Compliance Report, or later before the U.S. Supreme Court. Futility may be difficult and expensive to prove. New Mexico's evidence developed in 1988–89 for the remedies phase before the Special Master may provide the basis for this interstate, futile call defense. As one of New Mexico's attorneys at the time summarized:

There are three fundamental problems with irrigation down in the Red Bluff District [of Texas]. . . . The first problem is carriage losses. If you start with 10,000 acre-feet at the state line, by the time you divert it into the Red Bluff irrigation canals you are left with about 6,000 acre-feet. By the time that water gets to the farmers' headgates, you are left with 3,000 acre-feet of water. Thus, you have a 70% carriage loss from the state line to the farms. . . .

The second fundamental problem . . . is salinity. There is a place in the river south of Carlsbad called

the Malaga Bend, where there is a lot of brine accretions. . . . The average salinity of the water that Texas could have expected to receive, even had New Mexico delivered the extra water, would have been around 7,000 ppm. During some of the years between 1950 and 1986, Red Bluff would have received water with a salinity of twenty tons per acre-foot.

[T]he third problem the Red Bluff District faces is the extreme variability in flows of the Pecos River. . . . exacerbated . . . by the fact that the Red Bluff Dam . . . has never been used to even out the flows of the river in Texas. . . .

The bottom line was, faced with these natural problems, the Texas farmer never could make much of a profit from Pecos water. . . .

NEW MEXICO'S OPTIONS

If New Mexico under-delivers Pecos River water to Texas in 2003 or subsequent years, it has options for reducing water use in New Mexico and also options concerning its relationship with Texas. Some of these have been tried in the past, and others are currently being pursued by the state engineer and Interstate Stream Commission.

Intrastate Options Elsewhere in this guidebook are articles that address in some detail the “consensus plan” developed in tough, extended negotiations by an ad hoc committee of Pecos Valley stake holders, all of whom had a great deal to lose if they failed to devise a viable plan. If this plan can be fully implemented, it holds promise of assuring compact-mandated water deliveries in the future.

Alternatively, New Mexico might opt to employ strict priority administration to prevent or make up a shortfall under the compact, though this would be socially disruptive and politically unpopular. The New Mexico legislature may strengthen the State’s ability to enforce priorities by adopting more detailed priority administration rules, similar to those in Colorado. Indeed, the state engineer may be able to promulgate such a set of rules under his existing authority:

The state engineer may adopt regulations and codes to implement and enforce any provision of any law administered by him and may issue orders necessary to implement his decisions and to aid him in the accomplishment of his duties. In order to accomplish its purposes, this provision is to be liberally construed.

The acquisition of water rights by eminent domain is another possibility. The New Mexico Supreme Court

has recognized that the Interstate Stream Commission can exercise eminent domain in order to satisfy interstate water obligations.

Interstate Options New Mexico has both legal and negotiating options for approaching Texas. The strongest legal defense, in submissions and argument both before the River Master and the Supreme Court, may well be the futile call doctrine, as previously discussed.

New Mexico may also attempt to negotiate “interest-based” solutions with Texas that might have less serious consequences for New Mexico. At a minimum, an early negotiated agreement might avoid legal expenses, delay, and the risk and uncertainties associated with a multi-year legal proceeding. For instance, if New Mexico anticipates a shortfall, it might negotiate in advance a liquidated damage amount (per acre-foot of water or per acre of irrigated land) for Texas users. The State might lease or buy-out Texas users with a corresponding adjustment to the compact and Amended Decree. New Mexico might acquire supplemental water in Texas for Texas users at less cost than would be required to augment flows in New Mexico. New Mexico might pay for improved means of diversion in Texas. New Mexico might negotiate other forms of consideration, such as increased deliveries on other interstate river systems or apply any credits on other river systems, although this would be complex and controversial.

CONCLUSIONS AND RECOMMENDATIONS

A period of more than fifteen years has passed since the U.S. Supreme Court ruled that New Mexico had under-delivered 340,100 acre-feet of water under the Pecos River Compact and adopted procedures to prevent shortfalls in the future. New Mexico has undertaken a continuous program to prevent such shortfalls, but recent conditions indicate that the margin between compliance and noncompliance with the Court’s decree is very thin—especially in dry years.

In fashioning policies for water management in the Pecos River system, New Mexico decision makers should candidly recognize that:

- **The problem has not been solved**—Despite many efforts, recurring chronic Pecos River water shortages have bedeviled New Mexico since the 1948 compact. And, importantly, the consensus plan, although promising, is far from being implemented.

- **Delay and denial are not options**—River management is now more difficult because of the Endangered Species Act and other developments. New Mexico should proceed deliberately and expeditiously in an attempt to avoid a shortfall or to mitigate it if it occurs.
- **New Mexico should encourage cooperative measures with Texas**—Although the dispute has a long history, there are many newcomers to positions of responsibility in both states who may take a fresh view of these issues. The states might agree on a mediator to facilitate discussions concerning any shortfall and mitigation measures. New Mexico and Texas will be neighbors for a long time.

The Endangered Species Act

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This year marks the thirtieth anniversary of the Endangered Species Act. Signed into law by President Richard M. Nixon on December 28, 1973, the act is the consequence of almost three-quarters of a century of federal legislation identifying, conserving, and protecting our nation's natural heritage. President Nixon said of the act when he signed it, "Nothing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed."

For more than a quarter of a century, it has been the sentinel for endangered species. More than 515 recovery plans presently exist, but only a dozen or so species have recovered sufficiently to be removed from the list of endangered species since the law was passed. However, success is not measured only in the full recovery of a listed species. The strength of the law lies in its ability to prevent an individual, group, corporation, or agency from jeopardizing the continued existence of a listed species, or from destroying or adversely modifying its designated critical habitat. The act promotes the conservation of threatened and endangered plants and animals and their habitats.

The Endangered Species Act has endured thirty years of criticisms and repeated attempts to repeal or amend it. Few other acts have elicited such a wide range of emotions, especially here in the West. The western United States has the greatest diversity of endangered species. Of the more than 1,200 nationally listed plant and animal species, 796 species are found in the western United States, including Hawaii and Alaska. Hawaii alone accounts for 36 percent of these species.

Species evolve over time and become adapted to their habitats. Each occupies a niche, reducing competition with other species by becoming specialized to a particular resource or by utilizing a specific space. This is known as resource partitioning. Those species threatened by changing conditions or displaced from their habitat by more generalized species risk extinction. By 2002, 639 species of plants, fish, and wildlife had been classified as extinct in the United States. Whereas more than half of this number have been recorded within the last 50 years, it is not clear whether this apparent escalation is a result of some environmental condition or are species only recently recognized as endangered in the species listing

process. Humans factor prominently in the ever-changing conditions of those resources. We are one of only a handful of species that can modify the environment to suit our needs. Can conservation of resources vital to other species be achieved without putting our nation's population at social, cultural, or economic risk? And if we fail, don't we ultimately still run the same risk of extinction ourselves? These sorts of questions continue to be at the center of the Endangered Species Act and are debated on every front.

HISTORY

When settlers first occupied portions of the Southwest—and in particular, the arid plains of southeastern New Mexico in the 1870s—they felt that the area was more suitable for livestock grazing than for agriculture. Large ranches occupied thousands of acres. Stock water was among the first water rights appropriated in this area. Competition among claimants became fierce, and turf battles over range and water ensued. The most notable battle in this area was the Lincoln County Range War, which, in spite of its name, had less to do with the range than it did with the competition of business. The most prominent character of this period was Pat Garrett, the Lincoln County Sheriff who shot and killed Billy the Kid in 1881. Garrett retired to his 1,800 acre ranch near Roswell, where he promoted irrigation and farming in eastern New Mexico, a notion allegedly planted there years before by his one-time friend, Billy the Kid.

This was a time of discovery across the West. Trails and railways were established. Naturalists accompanied surveyors and geologists who were attached to parties searching for alternative railroad routes throughout the West or associated with boundary surveys. Army officers recorded and reported the details of naturalists' collections of new plant and animal species, but the concept of "endangered species" simply didn't exist.

In the 1880s conservation objectives began to align with the need of the people. The need for dams and larger irrigation ditches to hold and convey water was important for stock water and irrigation. The conservation movement grew out of the firsthand experience of political leaders with the problems of western eco-



The Pecos bluntnose shiner.

conomic growth, especially western water development. The federal government created agencies to aid and oversee water development projects in the interest of the public and its growing need to conserve vital resources in the West. Dams were built on many waterways to store and increase the precious supply of water for the benefit of agriculture.

The efficient development of water resources presented many opportunities, especially for wildlife. Habitat diversity for both aquatic and terrestrial species began to increase. Popular game species such as brown trout, yellow perch, and largemouth bass were introduced by the U.S. Fish Commission in New Mexico as early as 1883. The development and management of game and fisheries would be an added feature. Fish and wildlife were considered common property. The earliest known regulations were game laws created by states or territories. New Mexico created some of its own conservation regulations. For instance, it was illegal to take fish with poison, drugs, explosives, or by artificial obstructions; operators of mills or factories were forbidden to discharge sawdust or other wastes into open waters. Other laws would follow through the turn of the century. By the 1900s many of these regulations had passed into federal law.

The first federal act of its kind was the Lacy Act of 1900, which prohibited interstate commerce of ani-

mals killed in violation of state game laws. The Migratory Bird Treaty Act of 1918 and the Black Bass Act of 1926 prohibited persons from (among other actions) taking, capturing, killing, possessing, disturbing, and transporting across (into or out of) state or national borders any species protected by the one of these acts. Presently there are over 800 migratory species of birds listed under the Migratory Bird Treaty Act. Even the accidental killing of one of these birds can carry criminal penalties.

In 1966 the first of the true endangered species acts appeared. The

Endangered Species Preservation Act of 1966 provided that the Secretary of the Interior could acquire land for habitat protection and identify species that were threatened with extinction. It required the secretary to create a list of species that were threatened with extinction. In 1969 the Endangered Species Conservation Act replaced the Endangered Species Preservation Act of 1966. This act directed the Secretary of the Interior to prohibit the importation of listed fish and wildlife species and subspecies that faced extinction. Many point to this as the beginning of the environmental movement, which emerged from a groundswell of popular demand for conservation from sovereign government practitioners. Other environmental legislation, including the Clean Air Act (1963), the Clean Water Act (1972), and the National Environmental Policy Act (NEPA, 1969), stressed only the quality of the human environment.

With the Endangered Species Act of 1973, Congress held that various species of fish, wildlife, and plants in the United States had been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation. Listed species were considered of “aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” The act has undergone several amendments further defining its authorities and setting scientific policy guidelines. Indeed, the Endangered Species Act has become the

most powerful tool of this nation's environmental and wildlife protection toolbox.

In the Southwest a great number of species are listed under the Endangered Species Act. In New Mexico alone there are 54 federally listed species and 118 state listed species. In 1989 a federally threatened subspecies, the Pecos bluntnose shiner (*Notropis simus pecosensis*), was brought to the forefront of endangered species issues in New Mexico, just two years after its listing. The U.S. Bureau of Reclamation had just constructed one of the last major dams of the late twentieth century: Brantley Dam, just north of Carlsbad. In order to test the safety of the dam, the Bureau of Reclamation moved water from two upstream reservoirs to fill Brantley Lake. Placing almost the entire year's storage of water in Brantley Lake early in the season left little water in the two upstream reservoirs to make further deliveries for the rest of the year. This action prompted the U.S. Fish and Wildlife Service to contact the Bureau of Reclamation regarding probable impacts to the Pecos bluntnose shiner. The Bureau of Reclamation consulted with the Fish and Wildlife Service, under Section 7 of the Endangered Species Act, over the effect of dam operations on the federally threatened shiner.

The consultation resulted in a Jeopardy Opinion, a decision by the Fish and Wildlife Service that concluded that the proposed action jeopardized the Pecos bluntnose shiner and modified its critical habitat. The Fish and Wildlife Service directed the Bureau of Reclamation to fund a five-year scientific study to determine the biologic and hydrologic needs of the Pecos bluntnose shiner. Studies by the Fish and Wildlife Service and the New Mexico Department of Game and Fish over a five-year period were completed in 1997. The results of these studies prompted a change in the way dam operations should be run in the future.

High-volume, extended releases (known as block releases) were a detriment to the Pecos bluntnose shiner. Eggs and larvae were being pushed farther downstream into unsuitable habitats, such as deep confined channels and the large impounded water of Brantley Lake. Low flows or no flows between block releases left fish with diminished habitats or in isolated pools, where they might be subject to predators or left to die as pools dried. Coarse-grained sediments were trapped behind the dams, whereas fine-grained sediments such as clays went downstream to armor the banks, thus reducing the wide, braided, and sandy channels that created much needed habitats for the

shiner, and allowing highly invasive plant species such as the tamarisk (salt cedar) to further narrow and stabilize the banks.

IMPLICATIONS FOR PECOS RIVER OPERATIONS AND MANAGEMENT

The problems of the Pecos River are only a few of similar problems facing many native fish species of New Mexico. It is a challenge to all New Mexicans to think harder about the state's finite resources and how they should be managed. Can we live with the Endangered Species Act? Or, perhaps more importantly, how would we fare without the Endangered Species Act? Will the Pecos bluntnose shiner still be here in years to come? Will our farmers still be here? We now stand at a crossroads.

There is room for both the shiner and the farmers, but it will take reasoning, compromise, and understanding on the part of everyone involved. Albert Einstein gave us this basic premise over 60 years ago and it still holds true: "We live in a world of problems that can no longer be solved by the level of thinking that created them." At the time this was written, state and regional decision makers had agreed on plans regarding the future of the Pecos River, but plan implementation had yet to begin. However, managers, scientists, and farmers have invested great energy and a lot of time in their search for the best answers to the intense problems of the region. If our level of thinking has matured since the days of taming the West, then it will be time well invested.

SUGGESTED READING

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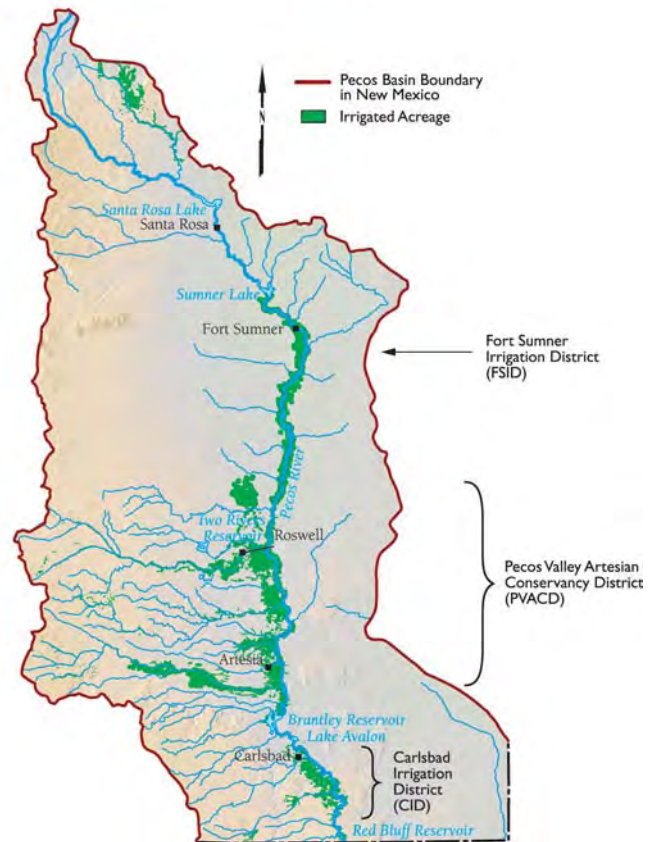
Irrigation Districts in New Mexico: A Legal Overview of Their Role and Function

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In New Mexico, as in other western states, irrigation districts were created to take advantage of federal reclamation law. Forces converged at the end of the nineteenth century to support the creation of a federal role in the development of western water. First, the public land laws of the nineteenth century did not work; land and water monopoly scandals abounded. Second, there was a decade of drought that began in 1886. The third factor was the political philosophies and common sense of John Wesley Powell. Powell was a political philosopher who proposed a whole new system of government for the arid region based upon the nature of the arid West rather than upon the standard preconceptions of distant legislators. To Powell, western water control was a national issue that required a federal presence. With Theodore Roosevelt's election, there was presidential support for a program of federal dam and reservoir building. The June 17, 1902, Reclamation Act was the result.

The Reclamation Act promised farmers water storage and distribution systems of a massive size at federally subsidized, interest-free rates. In order to take advantage of this federal program, local organizations had to be established. Irrigation districts were created with the sole purpose of delivering irrigation water to their members. Some irrigation districts have since evolved to also provide hydroelectric power generation, operation of recreational facilities, drainage, flood control, sanitation, and municipal and industrial water supply. All of the seventeen contiguous western states have adopted irrigation district laws, although some are called water conservation, water improvement, or reclamation districts.

On the Pecos River there are two irrigation districts: the Carlsbad Irrigation District (CID) and the Fort Sumner Irrigation District (FSID). CID operates the Carlsbad Project under contract with the U.S. Bureau of Reclamation. FSID is not a federal reclamation project, but obtained funds from the Bureau of Reclamation for reconstruction of its diversion dam. The other large irrigation entity is the Pecos Valley Artesian Conservancy District (PVACD), which is a ground water irrigation district that is also not part of a federal project. Under state law, all three districts are political subdivisions of the state.



Irrigation districts in southeast New Mexico.

LAW OF IRRIGATION DISTRICTS

The New Mexico statutes (NMSA 1978, chap. 73 arts. 9-11) provide for the creation and operation of irrigation districts. Article 9 applies to irrigation districts in general, whereas Articles 10 and 11 apply to irrigation districts cooperating with the United States under reclamation laws. Because both CID and FSID have entered into contracts with the Bureau of Reclamation, both are considered irrigation districts cooperating with the United States.

In general, irrigation districts are created by petition when a majority of resident landowners owning more than one-half of the lands within a proposed irrigation district sign a petition for the creation of an irrigation district and file the petition with the Board of County

Commissioners. After public notice, the Board of County Commissioners establishes the boundaries of the irrigation district and holds an election for the district's board of directors. After the initial election, one new board member is elected each year. After the initial three-year period, board members serve offset terms of three years.

The board of directors has the power and the duty to manage and conduct the affairs and business of the district; to enter into contracts; to employ agents, attorneys, and employees and prescribe their duties; and to establish rules and regulations for the distribution and use of water within the district. The board has the power to construct, acquire, or purchase canals, ditches, reservoirs, reservoir sites, water, water rights, rights-of-way, or other property necessary for the use of the district. The board has no authority to incur debt or liability beyond the express provisions of the act, and such debt or liability is absolutely void.

The board has the power to distribute and otherwise manage the district's water. It must distribute water on a *pro rata* basis to each landowner, based on the lands assessed under the act. The board may also lease or rent water to occupants of other lands within or outside the district for not less than one and one-half times the amount of the district's assessment tax. The board also has the power to initiate suits in order to protect or preserve its rights under the act.

Article 10 of New Mexico's irrigation district statutes provides a statutory scheme for irrigation districts to collaborate or "cooperate" with the federal government for funding, operation, and management of an irrigation project. Such collaboration is often necessary because the federal government provides long-term, low- or no-interest loans for the construction, maintenance, and operation of irrigation projects. Without this federal assistance, many large irrigation projects simply would not be possible; the capital needed cannot be raised at the local or state level. Pre-existing irrigation works can be included in a federal project upon signed consent of four-fifths of the owners of the existing works as filed with the Board of County Commissioners.

Regarding the applicability of federal law to federal reclamation projects, the statute reads: "[A]ll water, the right to use of which is acquired by the district under any contract with the United States, shall be distributed and apportioned by the district in accordance with the acts of congress and rules and regulations of the secretary of the interior, and the provisions of said contract in relation thereto." (chap. 73, arts. 10–16.) From this, it appears that water rights

obtained independently from a federal contract would not have to be distributed and apportioned in accordance with federal law but, rather, in accordance with state law, which calls for distribution as the board judges to be in the best interest of all parties concerned. This statute also preserves prior water rights, prohibiting the diversion of water that would be detrimental to a prior right.

Concerning property ownership, Article 10 provides that all property acquired under this act shall immediately vest in the irrigation district. There is a proviso, however, that an irrigation district may convey property to the United States insofar as needed for the construction, operation, and maintenance of works by the United States pursuant to a contract with the United States.

With respect to land and water management, Article 13 provides authority for cooperating districts to acquire and deal in land and water rights in the name of the district and for the use of the district. It also allows the board of directors, upon application of a landowner or upon its own motion, to transfer water rights from lands within the district that are not suitable for irrigation to lands that may be profitably and advantageously irrigated. And it includes notice provisions for water transfers as well as an opportunity for protest and an opportunity for a hearing. The transfer of water is generally thought to be within the sole authority of the state engineer. Surprisingly, however, the state engineer's authority over transfers of water within a cooperating irrigation district is limited. The district, however, is required to notify the state engineer after such transfers.

LAW OF ARTESIAN CONSERVANCY DISTRICTS

Artesian waters are ground waters that are under pressure in an aquifer, typically under enough pressure to bring the water to the surface if the aquifer is penetrated by wells. New Mexico provides by statute for the formation of artesian conservancy districts for the purpose of conserving the waters of any artesian basin within the state whose boundaries have been scientifically determined and whose waters have been beneficially appropriated for private, public, domestic, commercial, irrigation, or other purposes. This law was enacted to authorize the formation of PVACD in the Roswell artesian basin.

An artesian conservancy district may be formed when one-third of the landowners of the lands to be embraced by the district petition the district court for formation, setting forth the proposed name of the dis-

tract, the purpose or purposes of the district, the lands to be encompassed by the district, and the benefits that the lands of the district will receive as a result of its formation. After public notice, the opportunity to file objections, and a hearing, the district court will determine whether the district should be organized and, if so, will issue a declaration to that effect.

Upon declaration of the court that the district has been organized, the district becomes a political subdivision of the state and a body corporate with all the powers of a public or municipal corporation. The district's board of directors is vested with the power and authority to carry out the provisions and purposes of the Artesian Conservancy Act. This includes the authority to levy assessments against property, based on the net taxable value of the property, to generate revenue to pay for costs of improvements within the district.

Underground waters not under artesian pressure may also be included in artesian conservancy districts if the boundaries of the underground basins have been reasonably ascertained, the waters are being beneficially used, a substantial portion of the ground water is derived from the artesian basin, and the underground and artesian waters are so closely related that the artesian district can effectively conserve the ground water. The artesian conservancy district's board of directors must determine by resolution that it is desirable to include non-artesian ground water within the artesian conservancy district, and then petition the court to amend the decree to include such waters.

OWNERSHIP OF WATER RIGHTS WITHIN CID

The ownership of water and interests in water has become a significant debate, arising in the context of stream adjudications and federal reclamation projects. Analysis of the federal authority and responsibility over federal reclamation projects involves an analysis of the relationships in the project between the landowners who use the water, the irrigation districts that represent landowners in the management of the project, and the federal government that provides initial project funding and management. These relationships are established and influenced by a complex system of federal law, state law, interstate compacts, and contracts.

The Fifth Judicial District of New Mexico has recently addressed the water ownership question as a threshold issue in the ongoing *Lewis* adjudication. This adjudication involves a dispute over water rights within the Pecos River stream system. Water rights are

claimed by landowners and by the United States. The United States claimed water rights ownership by conveyance from the Pecos Irrigation District and by appropriating rights under NMSA 1978 chap. 72, arts. 5–33. The threshold issue before the Fifth Judicial District was whether project water rights were rights of the United States or rights of the district members. Relying primarily on the Washington State case of *Dept. of Ecology v. Acquavella* and the New Mexico decision *Holguin v. Elephant Butte Irrigation District*, the Pecos court found that “the beneficial ownership of Project water rights is vested in landowners in the Project measured by the amount of water devoted to beneficial use. Ownership of water rights in the Project are appurtenant to land in the Project upon which they are devoted to beneficial use. Project water rights are not owned by the United States or the CID.”

It is important to note that, although finding that the United States had no interest in “water rights,” the court did find that the United States and the CID have certain ownership rights and interests in the physical works and in diverting and storing water. The court characterized these governmental rights and interests as the authority to divert and appropriate water for the use and benefit of landowners pursuant to the Reclamation Act, and the right and interest in storage and distribution of project water to accomplish project purposes. The court stated that the “rights, interests, duties and obligations of the parties in connection with dams, reservoirs, storage and distribution facilities, and of the landowners to receive water therefrom are set forth in the agreements among the respective parties and New Mexico statutes pertaining thereto.” In its reconsideration of the issue, the court left open the determination of what the government's precise ownership rights and interests are; however, the court was clear in determining that the government's rights are not water rights. Thus, the court followed long-established New Mexico law that vests water rights in the landowners who apply water to beneficial use.

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Priority on the Pecos

G. Emlen Hall, *University of New Mexico*

No western interstate compact is as deeply and explicitly committed to the idea of priority enforcement as the 1948 Pecos River Compact. No other interstate compact thus far has so explicitly required priority enforcement to make up for compact under-deliveries. And no other interstate compact has seen such a complex response to the problem of under-deliveries at the state line as the decade-long New Mexico efforts between 1990 and 2000 to meet possible compact shortfalls and the very recent 2001–2003 legislative solutions. The fact that the ultimate compact solutions range so far afield from the traditional notions of priority enforcement is one measure of how far interstate water law in general (and the Pecos River Compact in particular) has strayed, for better or worse, from its prior appropriation roots.

As a means of apportioning a scant and variable water supply among claimants, the notion that the oldest users get first access to the available supply of water is deeply engrained in the prior appropriation doctrine. But the principle that priority in time of the establishment of a water right gives the better right to water from a common source was firmly and explicitly established in the water codes adopted across the West at the turn of the twentieth century. Then, in New Mexico, the priority principle was added to the 1912 state constitution's provisions on water. All state-based water rights were subject to priority principle.

In theory at least, the constitutional principle of priority allowed a senior water right holder to call priority against a junior holder of a water right from the common source. Once appropriately called, the junior user could take no water until the senior claimant had received 100 percent of his supply. In the parlance of western water law, there was no sharing of shortages.

Of course, such a priority system required an established hierarchy of priorities on a stream system, so that all claimants knew indisputably where they stood with respect to each other. Such a system required the establishment of quantities to which each right was entitled, so that the claimants knew when there was not sufficient water from the common source to fulfill their right. Such a system also required a central administrator committed to priority enforcement.

Each of these critical factors in priority enforcement has been difficult to establish in New Mexico in general,

and on the Pecos River in particular. The formal establishment of priorities and quantities for all Pecos River water rights claimants has been, to say the least, time consuming and elusive. The underlying suit to adjudicate all Pecos River water rights was filed in 1956, and today, almost fifty years later, it is still not complete. As more and more rights are adjudicated, more and more rights are metered, but neither the rights nor the sources are yet sufficiently measured to allow for system-wide allocations based on priority enforcement. And New Mexico state engineers have hardly devoted themselves to the priority principle. Under these circumstances, priority enforcement is difficult at best.

It is even more difficult on the Pecos River, for another even more important reason. Senior water rights on the Pecos River, principally in the Carlsbad reach of the river, are diverted from surface water sources. Junior water rights, principally in the Roswell reach of the river, are diverted from ground water sources. New Mexico has recognized for longer than any other western state that ground water sources and surface water sources are commonly interrelated, and nowhere more so than in the Acme–Artesia reach of the Pecos River. In the days before significant ground water development in the Roswell area in the early twentieth century, the Roswell artesian and shallow aquifers, a magnificent natural reservoir that collected water easily and yielded it more easily to wells, contributed a large amount of water to the base flow of the Pecos River. Wells tapping those aquifers reduced that ground water contribution in half by the mid-1930s. Continued ground water withdrawals would further reduce that contribution until it approached zero. Less base flow in the river meant less surface flow for the downstream Carlsbad Irrigation District, which held senior rights on the river. From the distance of an abstract legal system, it looked like a perfect situation for the priority mechanisms of New Mexico's prior appropriation system.

The problem was that ground water typically doesn't behave in a way that allows for reasonable priority enforcement. Efficient use of priority enforcement requires that when a junior right shuts down, the senior right receives the foregone water promptly. But when the junior water right is a ground water right, especially a well located some distance from an interconnected stream, it may take a very long time, some-

times years, for the foregone ground water to reach the river and the downstream senior irrigator. By then circumstances may have changed, the senior right holder may have too much (rather than too little) water, and the priority rationale collapses.

The lawyers have a name for such priority calls that will do no good: “futile calls.” The doctrine is pretty well established in western water law and fairly well developed in states like Colorado with active surface water priority enforcement. The doctrine has never taken hold in New Mexico, because New Mexico has seen such little priority enforcement of any kind. Even if priorities were enforced in New Mexico, it’s clear that the “futile call” doctrine would impose a major obstacle to shutting down junior Roswell wells to make up an under-delivery in state-line, compact-mandated water.

In addition, the general law of interstate compacts does not require priority enforcement within a state to meet interstate compact obligations. In the path-breaking 1938 *Hinderlider* case, the United States Supreme Court specifically held that compacting prior appropriation states did not have to rely on priority enforcement within their borders to make compact-mandated deliveries. The compacting states could agree on alternative systems, including in the case of the La Plata River Compact, rotating all of the water in the stream between the two states.

Why then is priority enforcement such an important factor in the administration of the Pecos River Compact? For one, it is still the law in New Mexico and the one constitutionally mandated method for apportioning a short supply between claimants to a common source. More importantly, priority enforcement, as a centerpiece of the doctrine of prior appropriation, is an explicit requirement of the 1948 Pecos River Compact itself. Article IX of the compact, a seemingly obscure and innocuous paragraph, provides:

In maintaining the flows at the New Mexico–Texas state line required by this compact, New Mexico shall in all instances apply the principle of prior appropriation within New Mexico.

With this provision, the compact drafters meant to avoid the problem associated with the *Hinderlider* case; now the compact itself required New Mexico to enforce priorities to make up for compact shortfalls. Representatives of the Carlsbad Irrigation District (CID) at the final compact negotiations at Austin, Texas, in 1948 insisted on inserting the provision to

protect the downstream, senior district rights from compact calls before the upstream, junior Roswell rights had contributed 100 percent of their junior entitlement.

Despite the provision in the compact and in basic New Mexico law, the chronically water-short CID always had trouble securing a full Pecos River supply. In 1976, as a parting shot, the retiring long-time head of the CID formally asked the state engineer to enforce Pecos River priorities for the benefit of an under-supplied CID. State Engineer Reynolds responded first by proposing what would become, 25 years later, a ground water augmentation plan for the Pecos River. When opposition surfaced, he insisted that the water rights of the system were not firmly enough established by adjudication to allow for priority enforcement.

The shortage problem became more acute in the late 1980s with the addition of interstate compact shortfalls to intrastate CID ones. A Supreme Court decree mandated that New Mexico provide, on average, an additional 10,000 acre-feet per year at the New Mexico–Texas state line. A literal reading of the compact’s Article IX would have required priority enforcement to make up for the water. Once again, in early 1990, State Engineer Reynolds called for augmentation wells in the Acme–Artesia reach of the river. Once again, Pecos River water interests balked. For awhile, priority enforcement looked like the only alternative.

State engineer experts told the state legislature that priority enforcement wouldn’t work because of the delayed effect of junior ground water wells on surface water supplies, and, even if it would, it would be an economic disaster for southeastern New Mexico. Combining hydrology and economics, the state experts showed that a compact-inspired priority call on the Pecos River might require New Mexico to shut down all water rights established after 1926, with a cost to New Mexico of billions of dollars. As an alternative, the State proposed to buy and retire water rights in the basin in order to provide additional compact-required flows at the state line.

The proposal went very much against the fundamental prior appropriation grain of New Mexico state law and Article IX of the compact. After all, junior water rights were by their very nature subject to the first call of senior rights; you didn’t pay to curtail them. But the State’s purchase-and-retirement plan had the obvious virtue of offering compensation for loss and of buying only from willing sellers.

The problem was that, without basin-wide

agreement, there was no guarantee that the additional water would reach the New Mexico–Texas state line where it would count for compact purposes. Once again, part of the problem was the senior, chronically under supplied 25,000 acres within the CID. Water added to the Pecos River in the Acme–Artesia reach would be taken by the CID to provide the full supply that its priority guaranteed it, but that upstream uses had denied it. Without CID's consent and agreement, the new compact water wouldn't reach the compact state line.

For the first couple of years of the twenty-first century, state officials struggled with the problem. The 2002 state legislature extended the period and increased the appropriation for the Pecos River purchase program, but now attached a new condition: No funds could be expended unless the principal Pecos River water users first agreed on a system that would get the additional compact water to the state line. The state money provided part of the carrot attached to this stick. But Interstate Stream Commission officials had an even more important tool for settlement: priority enforcement itself. If the entities did not agree, then the State would have to enforce formal priorities with the disastrous impacts predicted since the early 1990s. Priority enforcement had switched from a centerpiece of New Mexico state and federal Pecos River Compact law to a threat whose consequences should be avoided at any cost.

Dressed in these new clothes, priority enforcement finally worked. The Pecos River institutions that had fought over the river for the better part of the twentieth century finally agreed to a complex solution in early 2003. The agreement allocated land to be purchased by the State among the competing areas of the river. The agreement also allowed purchased water to reach the compact-critical state line. Most importantly, however, from the point of view of priority principles, the agreement provided for the augmentation wells in the Roswell–Artesia reach that had been suggested since 1976. Now, in 2003, all the parties agreed that the Interstate Stream Commission could divert from state-owned augmentation wells as much as 100,000 acre-feet in any five year period but no more than 35,000 acre-feet in any one year to make up for compact shortfalls. The parties agreed to let that water pass to the state line.

It remains to be seen whether this complex solution will work. Clearly, the 2003 agreements represent an engineering solution to the slow response time of ground water on the Pecos River. The augmentation wells may provide a new and effective model for

priority enforcement where junior water rights are ground water rights, and the delay in response to curtailment always has plagued the prior appropriation doctrine. The augmentation wells do quickly add junior ground water to the senior surface water supplies and so promise to reinvigorate conjunctive ground and surface water management with the basic prior appropriation principles mandated by both state law and the Pecos River Compact.

How We Got Here: A Brief History of Water Development in the Pecos Basin

John W. Shomaker, *John Shomaker & Associates, Inc.*

Familiar themes in the exciting history of the West have been played out in the course of water development in the Pecos Basin, and, as any good western should, the story may have a happy ending. The account starts long before the first Europeans arrived in the sixteenth century, but that is the beginning of the written record.

THE UPPER PECOS: PUEBLO AND SPANISH ACEQUIAS

In 1540 Coronado visited Pecos Pueblo and described villages and the irrigation of small tracts as far down the river as Puerto de Luna. The first Spanish settlement in the region, near Pecos Pueblo, was established in 1794, and by 1805 some 200 families had arrived in the upper Pecos. The Indian population decreased because of disease, pressure from Plains tribes, and perhaps other causes, and by 1840 had all but disappeared. Irrigation expanded and good crops in the vicinity of Anton Chico were noted by Captain R. B. Marcy in 1849. Settlement south of Puerto de Luna seems to have been limited by fear of the Plains tribes.

FORT SUMNER AND THE FORT SUMNER IRRIGATION DISTRICT

Fort Sumner was established in 1862 on the east side of the river 5 miles below the present town as part of the government's Indian policy. Some 8,000 Navajo and 400 Mescalero Apache Indians were detained there (the Navajo coming from their homeland in the Four Corners region following the "Long Walk"). The U.S. Army built ditches and laid out some 6,000 acres to be farmed by the Navajo and Apache Indians. Agriculture there was not successful, although part of the land continued to be farmed after abandonment of the fort in 1868. Interest was revived in 1903, and two individuals filed to appropriate 550 cubic feet per second (cfs) of the natural flow of the Pecos.

The Fort Sumner Land and Canal Company took over the filing. In 1906 they began construction of a diversion dam 2 miles above the town and a canal to serve approximately 10,000 acres. Acreage served by the upper part of the canal grew from 590 acres in

1909 to 6,650 acres in 1937. In 1918 the system was sold out of receivership to the Fort Sumner Irrigation District, which built a new diversion dam 3 miles above the original one. The district's water right, adjudicated in 1933, is for 100 cfs of the natural flow of the river to be applied on 10,999 acres.

THE GREAT SPRINGS AT ROSWELL AND THE HAGERMAN CANAL

Settlement of the lower Pecos Valley began in the 1870s. By 1880 some small farms were being irrigated from the North and South Springs and the Berrendo Springs. In 1889 Ralph Tarr of the U.S. Geological Survey counted 14 irrigation ditches in the vicinity of Roswell; the ditches were gradually extended until most of the flow from the springs was being used. Irrigation of small farms also developed along the Rio Bonito and Rio Hondo, the Rio Felix, and the Rio Peñasco, beginning in or before 1880.

Construction of the Northern Canal began in 1883 to divert water from the Rio Hondo just east of Roswell. Its purpose was to collect spring waters and return flow from irrigation. Three artesian wells were drilled between 1900 and 1910 above the canal diversion on the Hondo to supplement the stream flow, and later, after the springs had almost ceased to flow in the 1930s, water was supplied from a number of flowing wells. Water was carried southward about 5 miles beyond the Rio Felix for irrigation of lands along the Felix. The original scheme, conceived by P. R. Boone, C. D. Bonney, Capt. J. C. Lea, and Pat Garrett (the Lincoln County sheriff who shot Billy the Kid in 1881), included a canal system extending to the Texas state line. The system was taken over by J. J. Hagerman in 1889 and completed by 1904. It was purchased in 1907 by local water users organized as the Hagerman Irrigation Company. By the late 1930s the Northern Canal had come to be known as the Hagerman Canal.

CARLSBAD: THE PECOS IRRIGATION AND IMPROVEMENT COMPANY AND ITS SUCCESSORS

Large-scale agriculture based on irrigation from the Pecos itself was first envisioned in the mid-1880s by



Map of the Pecos River watershed in New Mexico showing locations and features mentioned in text.

entrepreneurs who included Garrett, Joseph Stevens, and John A. and Charles B. Eddy. Large land holdings were acquired by the Pecos Irrigation and Improvement Company, generally by purchasing individuals' 640-acre claims (filed under the Desert Land Act of 1877).

In 1886 overgrazing, exacerbated by drought, led to the loss of over 35 percent of the valley's cattle (the "big die"). This may have been what motivated Charles B. Eddy to build a small canal the next year to irrigate a tract near La Huerta, north of Carlsbad. The initial success of that enterprise led Stevens and the Eddy brothers to incorporate the Pecos Valley Land and Ditch Company in 1887. By 1888 Garrett had merged his ideas with Eddy's, and they were joined by Robert W. Tansill, a successful Chicago cigar manufacturer in New Mexico for his health, and Charles W. Green, a newspaperman and promoter.

A new "Pecos Irrigation and Investment Company" was incorporated to develop the projects. A diversion dam at the site of the present Avalon Dam, the Main Canal, and a flume across the Pecos to serve the Southwestern Canal were under construction in 1889. The diversion dam, McMillan Dam, and the canal system were soon complete, but floods in the summer of 1893 washed out the diversion dam, damaged the canal system, and nearly destroyed McMillan Dam. The system was repaired, but financial stresses led to takeover by the Pecos Irrigation Company in 1900. Floods in 1904 again destroyed Avalon Dam, and heavy siltation and leakage had already

diminished the usefulness of McMillan Reservoir.

The U.S. Reclamation Service, predecessor of today's Bureau of Reclamation, took the project over in 1906,



Carlsbad Flume 1890.

made repairs and enlarged McMillan Reservoir, then built Alamogordo (now Sumner) Dam in 1937. The Carlsbad Irrigation District (CID) developed rapidly; in 1926 members irrigated slightly more than their 25,055 water-right acres. Two more reservoirs, impounded by Santa Rosa Dam and Brantley Dam (which replaced the now-breached McMillan Dam), were completed by the Army Corps of Engineers in 1980 and the Bureau of Reclamation in 1988, respectively. The Carlsbad District is entitled to store a total of 176,500 acre-ft behind Avalon, Brantley, Sumner, and Santa Rosa Dams.

ARTESIAN WATER

The term artesian water refers to ground water that is under pressure. Artesian wells are those wells that breach the confining rock unit, allowing water to rise above the top of the aquifer and, in some case, to flow to the surface under its own pressure. A well drilled in 1891 by Nathan Jaffa in Roswell, although it flowed only about one gallon per minute (gpm), was the harbinger of an impressive new supply. By 1900 there were 153 flowing wells in use, largely to water lawns and gardens. A great deal of irrigable land still lay around Roswell, and the water supplies from the springs were being fully used. Beginning around 1903, wells were drilled for agricultural supplies between Roswell and Artesia. By 1905 there were 332 wells, and another 986 had been drilled by 1915 when drilling slowed dramatically. The wells typically flowed 500–1,000 gpm, and some reached 1,800 gpm. By 1937 approximately 57,000 acres were irrigated exclusively from artesian wells, and another 7,000 from a combination of artesian wells and other sources.

It was widely assumed (and hoped) that the supply was inexhaustible. The U.S. Geological Survey itself asserted in 1906 that “it is believed...there is no cause for fear that the water supply throughout the northern

part of the Roswell basin will give out or become inadequate for all requirements under proper economy of practice.” Even so, the area in which flowing wells could be found shrank from an original 663 square miles to 425 square miles by 1925; it was evident that the pressure in the aquifer was declining. At least as early as Cassius Fisher’s 1906 report, it was recognized that discharge from the artesian aquifer, part of it through the North and South Springs and the Berrendo Springs, contributed flow to the Pecos.

Until the New Mexico State Engineer undertook administration of the Roswell Underground Water Basin in 1931 at the urging of local interests, ground water development had been unregulated. The Pecos Valley Artesian Conservancy District (PVACD) was formed in 1932 to “conserve the waters.” It has plugged 1,518 wells since then, and has re-loaned some \$20 million in state funds for ditch-lining and land-leveling projects, and more efficient irrigation systems, since 1958. PVACD also purchased and retired almost 7,000 acres of irrigation rights. Adjudication of water rights, begun in 1956, led to the retirement of about 12,000 “illegal” acres within 10 years.

THE SHALLOW AQUIFER

Alluvium in the Pecos Valley, which overlies the artesian aquifer and the confining beds above it, is in close communication with the river and is another important aquifer in the Roswell–Artesia area. Few wells tapped the alluvium until the late 1920s, but this new source became important very rapidly. By 1938 approximately 29,000 acres were being supplied entirely from shallow ground water, and another 10,000 acres were irrigated from a combination of sources that included the shallow aquifer. There is also a shallow aquifer in the Carlsbad area, which began to be developed in the 1940s to supplement the surface water supply.



The first artesian well ca. 1892, near Roswell.

TEXAS'S COMPLAINT AND THE PECOS RIVER COMPACT

Irrigation from the Pecos had begun in Texas in 1877, and by 1914 work was under way or completed on ten projects totaling 173,000 acres. Water users in Texas were concerned about depletion of the supply from New Mexico. A compact to apportion water between the two states was negotiated in 1925 and ratified by both legislatures, but it was vetoed by the governor of New Mexico. The Alamogordo Agreement of 1935 set limits on New Mexico water use, in exchange for Texas's acquiescence in the construction of Alamogordo (now Sumner) Dam, and committed the two states to negotiate a new compact. The Pecos River Compact of 1948 has regulated delivery to Texas since, although with much controversy.

In 1971 Texas accused New Mexico of having failed to deliver 1.1 million acre-feet of water; in 1988 the U.S. Supreme Court found that New Mexico did indeed owe 314,000 acre-feet. New Mexico was required to pay \$14 million in compensation, and to meet the delivery obligation every year.

ADJUDICATION

The process of legal confirmation of water rights began in the 1920s. The "Hope Decree" of 1933 defined the rights to use surface waters of the Pecos from the headwaters to Avalon Dam, but (with one exception) it excluded the related ground water. In 1956 the "Lewis" suit was initiated by the state engineer and the PVACD to adjudicate Roswell–Artesia basin ground water rights. The suit was enlarged to

include the rights of the Hagerman Canal, then the Rio Hondo system, and ultimately (in 1978) all surface and ground water rights in the entire Pecos Basin.

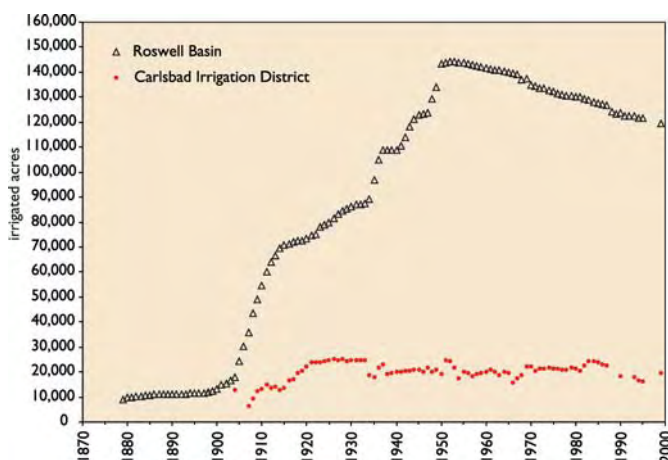
The Carlsbad Irrigation District's Pecos River water rights are generally senior to the Roswell area's ground water rights but are subject to the flow of the river, which has often been insufficient. The CID asked the state engineer to enforce priority in 1976, claiming that water use in the Roswell basin had impaired its rights. Litigation of a number of issues, including ownership of rights, acreage, priority dates, and limits on diversion and consumptive use, continued in the Lewis case until a settlement was signed by PVACD, the Carlsbad Irrigation District, the United States, and the State of New Mexico on March 25, 2003.

THE SYSTEM IN BALANCE: THE SETTLEMENT OF 2003

The settlement, presumably impelled by the prospect of draconian action by the State of New Mexico as a shortfall in state-line delivery loomed, confirms the acreage in the Carlsbad Irrigation District; provides for purchase of irrigated lands by the State to reduce the depletion of water in the basin (as many as 6,000 acres in the CID, 11,000 acres in the Roswell basin, and 1,000 acres in the Fort Sumner District); and establishes a program for pumping of an average of (not to exceed) 20,000 acre-feet per year from the Roswell artesian aquifer to augment the natural flow of the Pecos for the benefit of the CID, and to meet the delivery requirement at the state line. It has taken more than a century for large-scale water use in the Pecos Basin to mature, so that it is more or less in equilibrium with the supply and with obligations to Texas. That we have reached this point is grounds for optimism.

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Irrigated acres in the Roswell basin and Carlsbad Irrigation District.