

Scott Verhines is a New Mexico native and resident of Albuquerque. He is a consulting civil engineer with over 30 years experience focusing on water resource, transportation, and public works projects. He has managed and participated in the preparation of over 200 hydrologic/hydraulic studies ranging in size from individual residential lots to over 500 sq. miles of watershed. Scott has overseen the analysis and design of drainage/flood control infrastructure projects from \$5,000 to over \$15 million in construction cost, transportation projects to over \$30 million, and water supply projects to over \$400 million. His experience lends particular strength in the areas of program management, public involvement, collaborative decision-making, and coordinating multi-task and multi-discipline projects involving a variety of local, state and federal agencies. He currently serves as program manager to the Eastern New Mexico Rural Water Authority. Scott received a B.S. in civil engineering from Texas Tech University, an M.S. in civil engineering with an emphasis on water resources engineering from the University of New Mexico, and an MBA from the University of New Mexico.



Greg B. Gates is a senior water resources engineer. He graduated from the University of Texas, Austin, with a master's degree in environmental engineering in 1994. He served in the Peace Corps in Lesotho, Southern Africa, before joining CH2M HILL in 1996. Over the past 12 years, Greg has been involved in a number of major water projects in New Mexico including the Ute Pipeline Project, the Albuquerque Water Resources Management Strategy, the Buckman Direct Diversion Project, and the Aamodt Settlement. Greg specializes in groundwater modeling and hydrology and serves as a project manager and technologist for a wide variety of water resources related projects.



## Just Add Water: Eastern New Mexico Rural Water System Status Report

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Good morning everybody and thanks for coming back. We thought we could scare you away with that fire alarm but I guess not. On behalf of the eight city and county council members of the Eastern New Mexico Rural Water Authority, we appreciate the opportunity to speak to you this morning and really thank the institute for putting us on the schedule. Greg and I are going to tag team a little bit as we talk about the project. The project is more affectionately known as the Ute Pipeline Project but the official name is the Eastern New Mexico Rural Water System and it really does fit the conference theme. This is one of those surface water opportunities that has been trying to happen for many many years and I will talk to you about some of the history of the project.

Figure 1 shows the project area. You can see the Texas-New Mexico state line, Interstate 40, Ute reservoir, and Ute dam and Tucumcari. The dark to light area is the cap rock of about 800 or 900 ft of dirt to lift. It is the most imposing part of our project from a physical feature point of view. Note Clovis, Cannon Air Force Base, Roosevelt County, and Quay County, just so everybody understands what we are taking about and where we are.

Let me give you a quick review of why we are doing this project, the background of the project, the alternatives that were looked at, and how we came up with what we call the best technical alternative to deliver water to these eight cities and counties. I'll then discuss some of the challenges of doing a regional rural water project that has never been done in New Mexico quite like this before. I'll mention some of the successes that we had. Secretary D'Antonio talked yesterday about where we are in the federal process and I will try to elaborate on where we are.

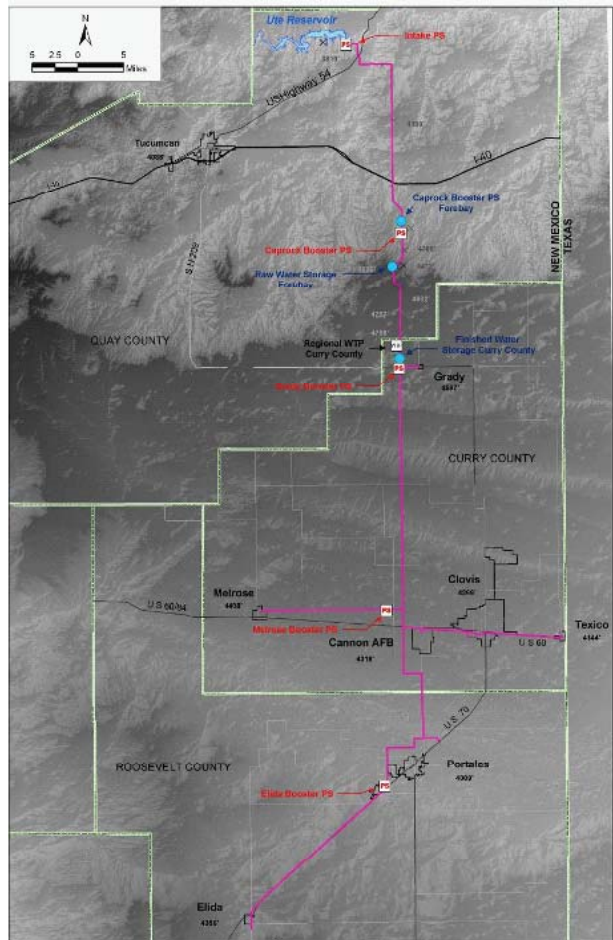


Figure 1. Project site

So why are we doing this? The western edge of the Ogallala Aquifer encroaches into eastern New Mexico and you can think of it as a saucer and New Mexico sits out on the very thin edge of the saucer. They have known for many years going back to the 1930s and 1940s that water would be problematic over time. Ute Reservoir was built to capture a share of water on the Canadian River under the three state Canadian River Compact from Texas, Oklahoma, and New Mexico. The Ogallala Aquifer is very problematic and Greg is going to get into the technical details of why. The aquifer continues to decline in this part of the state. We are

seeing declines in water quality as well. One of the reasons for converting to surface water is to offset that decline in quality. Even today they are starting to see the economic implications of running out of groundwater in the aquifer. This project will offset that.

Right now, all of the water for agricultural and municipal interests is 100 percent groundwater out of the High Plains Ogallala Aquifer formation. One of the reasons we are doing this project is to disconnect that competition between municipal and agricultural interests so they are not both competing for the same resource.

Also, state engineer D'Antonio talked yesterday about putting to use this investment that was made back in 1959 and 1960. I think in those days Ute Reservoir was built for around \$28 million and the value today is closer to \$140 or \$150 million. We are talking about delivering 16,450 acre-ft to these entities. Figure 2 is a little sketch for when we talk to a layman audience in our communities. For the folks without a strong technical background, we sketched this some years ago and I still find it useful to explain to folks why the project is being done. If you look at the graph with cost on the y-axis and time on the x-axis, as the aquifer continues to decline over time, the cost of providing water out of that resource somewhat mirrors that curve. The Eastern New Mexico Rural Water System would start at a higher initial cost to the water rates and end users. Over time you are better off being a part of this project than not. There are some who are saying that we are already approaching the point where if something doesn't happen in the near term, it will be economically disastrous for the area. Greg has a few graphs that he will talk about shortly on that as well.

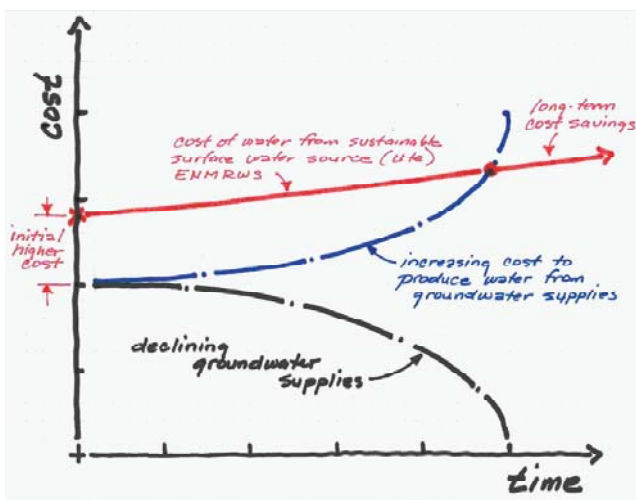


Figure 2. Eastern New Mexico Rural Water System Project

A little bit about the project history: the Canadian River Compact goes back to 1951 and regulates the water and who gets what on the Canadian River in the three states. The project was conceived in a feasibility study in 1963. It is almost 50 years old now and these entities have been trying to make the project happen over there for a long time. I have been working on it pretty diligently now for 10 years. I had a full head of hair when we started all of this and I think Greg may have been 6'3 or 6'4 back in those days. It has required a lot of effort to try to make this thing happen. We recognized that the aquifer was going to have trouble back in the 1960s. The reservoir really was built for municipal and industrial water storage in New Mexico.

There are two entities at play right now. One is the Ute Reservoir Water Commission. It is made up of 12 members and includes four from Quay County and two from the Village of Logan, Quay, Curry, and Sandoval counties. It is a joint powers agreement, and exists for the purpose of contracting with the State of New Mexico to purchase raw water out of the reservoir. Four members from Quay County in 2005 elected not to participate in the development of the pipeline project but they continued to reserve their share of water out of the reservoir for other purposes. The eight members that I just described are the active members that make up the Eastern New Mexico Rural Water Authority that are actively developing the project. With that I will let Greg get into the next few slides.

Greg Gates

For those of you who don't know me, I think Scott's joke about my height decreasing over time might not have made too much sense until I stood up. As Scott pointed out, the Ute Reservoir was constructed to use New Mexico's water allocated in the Compact for municipal and industrial purposes. It was completed in 1959 and 1960 and the reservoir filled with water. The Canadian River Compact is a little bit different from some of the other compacts in that it is actually a storage compact. It allows for New Mexico to store 200,000 acre-ft of water below Conchas Dam. Once that storage level is reached, any additional water goes to Texas. The Compact is unique in that sense. New Mexico can consume all the water that it can put to use up to that point, but it cannot store anything beyond the amount specified in the Compact.

The reservoir is owned and operated by the New Mexico Interstate Stream Commission (ISC), which is also unusual when compared to other reservoirs in the state. In 1987 the ISC estimated Ute Reservoir would

have a firm yield of about 24,000 acre-ft. That 24,000 acre-ft was assumed to be available about 90 percent of the time. Communities reserving water recognize that based on the hydrology, the supply will be available most of the time and will take steps to deal with the times when that total water supply will not be available. The firm yield was updated in 1994 as the basis for the contract with the Ute Water Commission. Currently, the Ute Reservoir Water Commission contract with the ISC fully allocates that 24,000 acre-ft.

The communities that are developing the Eastern New Mexico Rural System account for 16,450 acre-ft of the Ute Water Commission contract. The contract is set to expire in December 31, 2008 and the Commission has asked for extensions on a one- or two-year basis over time. As long as they are showing progress in developing the water resource, the ISC has historically been generous in granting those extensions. There has been a fair amount of progress made in the last couple years and we are hoping to get another extension granted. The remaining portion of that water is held by Quay County interests – that is 7,550 acre-ft of water.

As part of the decision making process and looking at alternatives, we put together a fairly simple spreadsheet model of the reservoir. We wanted to look at what the impact of various alternatives would be as opposed to a baseline condition. The baseline condition was calculated by examining release and storage data along with evaporation to estimate inflow. The blue line in Figure 3 shows the scenario that is the actual reservoir volume over time that we used to develop the baseline in the model. Up until about 1984, the dam had less capacity. The spillway height was increased in the 1980s to allow for more storage capacity. The baseline scenario is shown in dark blue and does not include any use of the water by the project. The green line shows withdrawal of 16,450 ac-ft of water per year on a peak month basis.

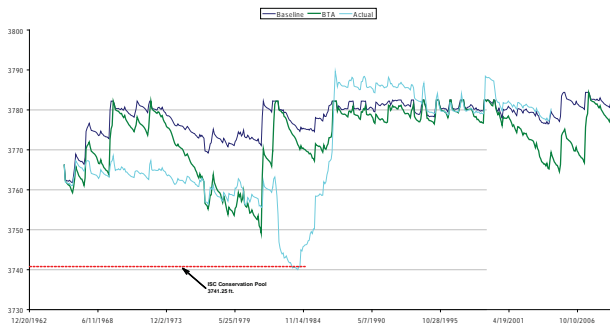


Figure 3. Ute Reservoir Model Simulation and Background Results

This is the alternative that we chose in the decision making process and is referred to as the “best technical alternative” (BTA). You can see that as you use that 16,450 acre-ft of water, you get some declines in the reservoir. At other times, the results of the BTA are similar to the baseline. What we found is that on average, the reservoir elevation was about 3 ft under the baseline condition and there was a maximum of 20 ft difference between BTA and baseline.

The other thing to remember is that when you are not taking that water out and using it, it builds up in the reservoir and is eventually released to Texas. We found that over a 60-year period, looking at the historic hydrology, if you didn’t use that water, an additional million acre-ft of water would go downstream to Texas when compared to the BTA project scenario.

The BTA was derived from a decision process that evaluated four surface water and two groundwater alternatives. Non-monetary benefit scores of the alternatives considered in the decision process are shown in Figure 4. You may note that the alternatives considered are not entirely equal. The “no project” alternative is essentially a continuation of current practices and would not be sustainable. The current estimated life of the aquifer is on the order of 20-50 years.

New Mexico American Water, who provides water for the City of Clovis, had about 28 wells in 2000 with a capacity of about 10,500 gallons per minute (gpm). By 2004, they had increased the number of wells to 33 but had lost capacity to achieve a total capacity of about 6,500 gpm. In 2008, NMAW had nearly doubled the number of wells used in 2000 but has less capacity. Figure 5 presents NMAW capacity and number of wells over time.

The BTA had the greatest non-monetary benefit to overall cost ratio. The BTA includes a pipeline from Ute Reservoir to a water treatment plant in Curry County with pump stations to boost flow over the caprock. There are raw and finished water storage tanks and the diversion structure and raw water overall system are designed to operate on a peak day basis. The 2006 cost of this project was about \$436M with a 75 percent federal, 15 percent state, and 10 percent local cost share resulting in a wholesale water rate of about \$2.42 per 1,000 gallons of water to users. The Preliminary Engineering Report and 10 percent design are complete. The 30 percent design is in progress.



Figure 4. Benefit Scores of Alternatives

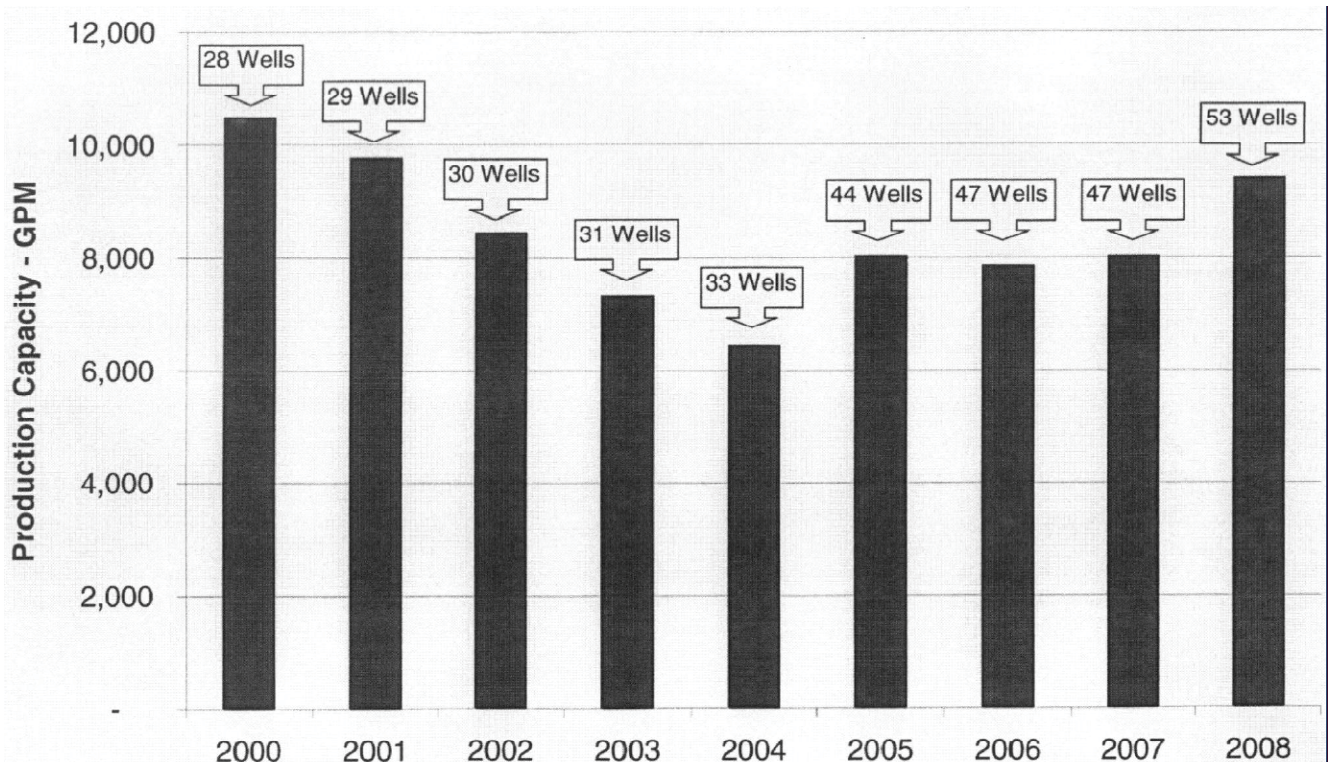


Figure 5. NMAW Wells Capacity and Number Over Time

Scott Verhines

Thanks, Greg. So again, I mentioned that Rural Regional Water Supply projects are a little bit different than what the Albuquerque Bernalillo County Water Utility Authority did, and although there are some similarities, there are significant differences. Some of those challenges are that we have eight cities and counties; we have mayor's councils and commissions that turn over every few years. We have backed up and started the education process with everybody many times now over that 10-year period. This is the most complex, largest public works project those entities will probably ever undertake. They are used to having projects that are planned, designed, and built all in a year; we are 10 years into this project and are just getting out of the planning stages and into the design stages. Perseverance and keeping everybody at the top of their game is part of the task I have right now. Some days are better than others, but I think for the most part, everybody is very strongly on board and recognizes the consequences of not putting this project together.

I won't go into all the details of the challenges. The obvious one is we are working on federal authorization right now for that 75 percent federal commitment. Whether or not it will happen before this Congress recesses at the end of the year has yet to be seen. We do understand that there will be a lame duck session right after the election, the week of November 17. We also understand that the omnibus Public Lands Bill, Senator Bingaman's bill that John D'Antonio talked about yesterday, contains our project and it will be a high priority for that lame duck session.

I want to point out that Cannon Air Force Base is a major economic benefactor to the area as you can imagine; it is a very strong part of the community. They have a new special operations mission coming in and the base is growing. We have a very fine line that we have to walk with Cannon Air Force Base. On one hand we need to be able to recognize the problem and decide what we are going to do to fix it. At the same time, we don't want the problem of being able to provide water to the military installation to impact their ability to keep their mission growing. We are very conscious of that, as is all of the New Mexico delegation.

We put together a strategic plan a couple of years ago, and there are eight main elements that we have underway right now in order to keep the project moving ahead:

- Infrastructure Project Development
- Momentum Building

- Financing and Funding
- Federal Authorization
- Project "Campaign" (Full Court Press)
- Coordination Cooperation
- Organizational Capacity/Structure
- Public Awareness and Support

Greg described the infrastructure project development, the technical pieces of the project. Greg also mentioned that we have 30 percent design underway and expect that to be delivered in May of 2009. We have an environmental assessment that is well underway, which should be delivered about the same time. We will follow that up with a value engineering analysis to re-evaluate the cost of the project, and then we will develop a phasing and implementation plan.

Federal authorization is our number one goal right now. In the House of Representatives this year, we went through the Resources Subcommittee Hearing and the Resources Full Committee Markup Hearing. We then went to the floor of the House and the bill was passed by a two to one margin. We had an identical bill working its way through the Senate. Last year, we had a field hearing with Senator Domenici and Senator Bingaman in Clovis. This year we had a hearing before the Energy and Natural Resources Committee in Washington D.C., which we followed a couple weeks later with a Markup Hearing, both of which passed the bill unanimously out of committee.

The bill is now included in Senator Bingaman's omnibus Public Lands Bill. That is the one that we are waiting for and we are cautiously optimistic that it could happen before the end of the year.

We have also had a number of successes over the last few years, not the least of which is support by the State of New Mexico, which has invested \$12.5 million in the project so far. We have had about \$3 million in federal write-in support through the Bureau of Reclamation. The state agencies have been terrific to work with including the Office of the State Engineer, the Interstate Stream Commission (ISC), New Mexico Water Trust Board, and the New Mexico Finance Authority that operates the Board. Greg mentioned that we are looking to extend our water purchase beyond December 31, 2008 and as long as we show progress that we are getting this project done, the ISC has been very willing to work with us. I would like to thank our congressional delegation, the staff at the state agencies, some of whom are in the room today. Without them we wouldn't be here today.