Executive Summary

Workshop on Water Banking in the Lower Rio Grande, Southern New Mexico

New Mexico Water Resources Research Institute

November 12, 2015

INTRODUCTION

Based on expressed interest by numerous water stakeholders in southern New Mexico over a period of several months, on November 12, 2015, the New Mexico Water Resources Research Institute (NM WRRI) convened a one-day workshop for water users to discuss the benefits, limitations, best practices, implementation methods, and future development needs relating to the potential establishment of a water bank in the Lower Rio Grande in southern New Mexico. This summary provides an overview of the material covered during the workshop. Additional information is available on the NM WRRI webpage http://waterbank.nmsu.edu/speaker-slides/ .

The Lower Rio Grande region in southern New Mexico relies on a healthy agricultural sector to maintain a thriving economy. The area is a major agricultural center for the state, producing crops such as pecans, chile, onions, alfalfa, hay, cotton, and other crops. In addition, recreational water activities at Elephant Butte and Caballo reservoirs also have a significant impact on the state's economy. The municipal, industrial and agricultural water users in southern New Mexico face major challenges dealing with surface and groundwater scarcity and litigation relating to 1938 Rio Grande Compact deliveries. Water banking is seen as a potential tool for these water users and water administrators to mitigate the risks presented by drought and judicial outcomes.

The workshop was sponsored by key stakeholders in the Lower Rio Grande including the Public Service Company of NM, a multi-university grant funded by the US Department of Agriculture, NM WRRI, City of Las Cruces, Farm Credit of New Mexico, New Mexico Pecan Growers, Southern Rio Grande Diversified Crop Farmers Association, Camino Real Regional Utility Authority, and New Mexico State University.

Approximately 100 stakeholders participated in the workshop including farmers, water-user groups in the area, elected officials, academic faculty and students, state water agency staff, legislators, and other interested individuals. This event was motivated by widespread recognition that it is time to address the effects of groundwater pumping on surface water depletions by considering flexible administrative mechanisms such as water banking. Water users in the area wanted to learn about the advantages of establishing a water bank that is "likely to produce substantial economic benefits"[1] in the Lower Rio Grande. A conjunctive use approach for water banking can "enhance benefits from being able to use both surface water allotments and groundwater entitlements."[2] In addition, water banking represents a tool able to mitigate the effects of long-term, global, and the uncertain nature of climate change, which affects water availability resulting in water scarcity and drought.

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[1] Colby, Bonnie G. Lower Rio Grande Groundwater Banking Draft White Paper. University of Arizona, Consultant to New Mexico Interstate Stream Commission, Distributed November, 2015.

[2] *Id.*

Policymakers, local stakeholders and the water communities across the state of New Mexico are discussing and considering what action could be taken to develop water banking in the Lower Rio Grande, southern New Mexico. Several states such as Kansas, Nebraska, Arizona and California have developed and implemented water banks. An analysis of these water banks can shed light on the management practices best fit for the Lower Rio Grande. In New Mexico, water banks have been debated and addressed as vehicles to achieve efficient transfers of water resources. The Elephant Butte Irrigation District (EBID) recently released its newly developed Depletion Reduction and Offset Program (DROP) that it feels "will allow users to offset groundwater depletions by entering into voluntary fallowing agreements with EBID members who have combined surface and groundwater rights."[3] DROP represents a very important initiative in the management of water along the Lower Rio Grande in southern New Mexico (2015-OP13).

Drawing from the environmental economics, impacts and vulnerability, and the community risk analysis, the workshop sought to glean insights on how to better quantify the benefits of developing and implementing water banking in the Lower Rio Grande in southern New Mexico. The main objectives of the workshop were to learn what a water bank is and how it functions, and to identify and discuss the pros and cons of implementing a water bank in the Lower Rio Grande region of southern New Mexico. To meet this objective, experts in water banking were invited to present their knowledge and suggest approaches for local users to contemplate in deciding how to proceed. Several speakers from states that have implemented successful water banks described their experiences and related those experiences to the water situation locally.

After the workshop, representatives from water user groups in the region convened to discuss the next steps in the process. The NM WRRI will continue to host discussions on the effort.

In November 2010, the NM WRRI published a technical report detailing and analyzing water right prices in New Mexico´s Lower Rio Grande Basin[4], which can be applied in order to establish a fair market value for water rights. Based on the outcome of the workshop, the NM WRRI will provide technical support to help better understand how to improve the principles and implementation methods governing the development and implementation of water banking.

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[3] King, Phil, Elephant Butte Irrigation District Offset Program. Abstract, Workshop on Water Banking in the Lower Rio Grande, Southern New Mexico, New Mexico Water Resources Research Institute, New Mexico State University, November 12, 2015.

[4] DeMouche, Leeann; Landfair, Shawn; Ward, Frank. Analysis of Water Rights Prices in New Mexico's Lower Rio Grande Basin. TR 356 New Mexico Water Resources Research Institute (2010). Available at http://nmwrri.nmsu.edu/?page_id=738

WORKSHOP PRESENTATIONS AND DISCUSSIONS

The workshop agenda included expert presentations by relevant speakers from the highest level in the management of water banking.

Welcome

NM WRRI Director, Sam Fernald and Las Cruces Mayor Pro Tem, Greg Smith

The workshop began with welcoming remarks from the NM WRRI Director, Dr. Sam Fernald and Las Cruces Mayor Pro Tem, Greg Smith. Dr. Fernald welcomed participants and encouraged everyone to appreciate the collective willingness to move forward that brought all the different groups together to this meeting, and to continue to work to move forward together. Mr. Smith talked about the importance of water rights. He expressed the need to protect all users, especially agricultural users. In addition, Mr. Smith brought attention to the Elephant Butte Dam, which was constructed between 1911 and 1916. The reservoir started filling in 1915 and was a major engineering feat in its day. Elephant Butte Dam is the perfect setting for water banking, a real and a successful project. He also recognized and thanked the attendees for the hard work by all involved entities in ensuring the good management of water.

Water Banking in New Mexico

Tom Blaine, New Mexico State Engineer

Mr. Blaine emphasized the importance of this workshop and why it is necessary. The workshop represented the day that everybody is working together for solutions. He thanked people from out-of-state for coming and providing insights. He also thanked the Rio Grande District Manager who is on the front line and is doing an excellent job for the State of New Mexico. In addition, he thanked the general counsel and all technical staff.

Mr. Blaine showed special interest in agriculture uses and the essential role of the agriculture industry to provide food security. In addition, he explained that farmers want to farm their land because they chose that style of living and they wish to continue with their activity. Mr. Blaine also talked about the different types of water requirements for each crop. The time of irrigation for one crop is different from the others. The main goal is to provide sustainability for each agriculture area. Mr. Blaine also highlighted groundwater as a vital source in the State of New Mexico. The work that he does is water management and to provide solutions to stakeholders around the State. According to him, this workshop is the tool to provide solutions for water distribution and allocation management.

Mr. Blaine provided relevant key points for this workshop. He encouraged the workshop attendees to listen to information and to keep an open mind. The intention of this workshop is to provide solutions and to establish collaboration among different stakeholders in the region. This is the opportunity to bring peace to the Valley.

Trading Water and Money to Manage Economic Risk During Shortage

Bonnie Colby, University of Arizona

Professor Colby worked under contract from May 2013 to June 2015 with NM Interstate Stream Commission (ISC) to conduct water bank scoping for the Lower Rio Grande Basin. The Lower Rio Grande Water Users (LRGWU) provided the financial support for participation in the workshop. Her presentation was based on her expertise and experience with water trading programs to mitigate drought impacts on regional economies. Professor Colby provided the definition and analysis of water banks. She emphasized that water bank is a generic term and that it can vary in scale from multi-state to neighboring water users in small basins. Water banks can be temporary and intermittent transfers, can include groundwater, surface water, reclaimed water, desalinated water or any subset of these. A well designed water bank will reduce regional economic losses when curtailment looms, will protect regional economy during drought, compact calls, and from the local perspective, will reduce the impetus for federal and state mandates. The beneficiaries of a water bank are junior water users facing curtailment, farmers paid to fallow, regional businesses and economic vitality, land values, tax base, and public services. Transaction costs for water banking were shown in the presentation as the “friction” in the system, grit in the gears, hassle factor, costs of finding trading partners, determining price, obtaining approval, implementing, and high transaction costs erode impetus for offering to fallow and for acquiring replacement water. Professor Colby also explained the elements of a successful water bank include: serving a diversity of water uses with varying willingness to pay (WTP) to reduce the risk of curtailment, providing “replacement water” with low transaction costs, providing timely response to curtailment of juniors, and maintaining hydrological integrity. The consideration of hydrological integrity can be characterized as – “the ratio” used by the water bank. Where the ratio is:

$$\frac{\text{reduction in consumptive use (CU) due to fallowing}}{\text{allowable CU by party paying for fallowing}}$$

This ratio can vary for different types of water uses and for different locations of fallowing and use locations for the banked water created by fallowing. Professor Colby also provided insights about the price of water banking and the methods to establish water prices. Water bank prices must be high enough to attract farmers to enroll acreage and to avoid being so high as to dampen the regional economy, and discourage new businesses and expanding economic activities. The pricing mechanism needs to reflect changes in water supply conditions, reflect changes in farm profitability – crop prices, yields, input costs and reflect changes in demand by non-agricultural water users. If the pricing mechanisms are not responsive to these factors – costly gaps can occur between water needed and water made available through fallowing.

Discussion

Professor Colby answered several questions from the audience.

- **Q:** Question regarding fallowing being the way to allow for water to be transferred. Has anyone developed a process where they have alfalfa and it shifts? How do you work that into a water banking scheme?

A: Professor Colby's response: There are a lot of options. Colorado is considering "regulated deficit irrigation" in which a farmer deliberately under-irrigates alfalfa, below the customary crop irrigation level. The farmer accepts a loss in yield in return for a payment. Professor Colby suggests this deficit irrigation approach be explored where remote sensing and local field experiments to calibrate remote sensing are available to establish the change of crop consumptive use for water production. There are some studies around the western U.S. on this and she can provide a background. Remote sensing is very promising.

- **Q:** What are you actually banking? Is it groundwater or surface water?

  A: Professor Colby's response: the answer varies by area. Banking can mean physically storing water in an aquifer or reservoir to be used in the future to generate economic benefits.

  In other water banks the water is not actually stored somewhere, its use is being cut in one location and being put to use in another location. Water banking is used to reduce consumptive use and to improve the hydrology system as a whole.

- **Q:** Where did your factor of "three" come from in pricing? Do you find you need three times the cost from experience?

  A: Professor Colby's response: This is based on experience. Looking at fallowing programs in the West, three times seems to be enough to make the program interesting and gives farmers incentive to consider it. That's just an instinct and varies in every basin; three times the net return over the variable cost per acre foot of water consumed.

- **Q:** Another question was related to water banks that work in multiple states. What are the pros and cons?

  A: Professor Colby's response: Moving water across boundaries causes shudders of concern in water user communities. The reason we formed a proactive water bank in Arizona is because we needed to protect our water from California. Water banks that move water across basins are much more controversial. Colorado, for example, is considering a water bank that can move more water from the west side to the east side of the state and concerns over that are making progress difficult there. Professor Colby wouldn't recommend considering interstate banking here over the next several years. It would be more fruitful to concentrate on getting a well-designed bank functioning for the LRG in New Mexico.

- **Q:** An audience member asked if Professor Colby has thought about what types of water banks we would need here. The discussion brought up the point that we have a surface water problem. There could be a separate groundwater management problem. There may be different groundwater management. Are we talking about two different banks or one? We have two different problems.

  A: Professor Colby's response: This is a puzzle that you will need to wrestle with. Ideally, from her view related to transaction costs, water banks have to provide responsiveness at a low cost. A water bank that coordinates and deals with both groundwater and surface water for those in need of replacement water is ideal. However, you may need to think of another type of water banking arrangement that is distinct between groundwater and surface water.

Economic Analysis of Institutional Adjustments to Drought in the Rio Grande Basin: Water Trading

Frank Ward, New Mexico State University

Ongoing issues and challenges in the Rio Grande Project area point to the need for a water bank to be established to soften the blow of ongoing water shortages and potential future unfavorable court rulings. A water bank reflects the practice of forgoing water deliveries during critical periods, transferring it for someone else to use in that period in exchange for a price or delivery in kind. Little analysis to date has shown economic benefits of a water bank to avert priority administration in the Rio Grande Project area. This presentation illustrates economic benefits that can be expected in a severe drought from a water bank set up to avert priority administration. It presents a simple example illustrating economic gains produced by a water bank based on typical crops and cropping economics of the Lower Rio Grande Project area. A prototype water bank is shown to reduce drought damages considerably. Establishing a water bank produces larger economic gains with: More diverse farms, more diverse water requirements per acre, more diverse net revenue per acre, larger water shortages, more diverse seniority levels, juniors producing higher income per acre foot than seniors, and more diverse participants such as cities and the environment. Formal models can better track consequences of alternative banking arrangements in light of the wide diversity of farms, crops, and water right seniorities present in the Rio Grande Project area. Several important challenges remain about the most efficient design for a water bank.

Discussion

- **Q:** The audience was interested about a question related to the previous discussion with Professor Colby. Where does your factor of three come from regarding pricing? Do you find you need three times the cost from experience? Do you have a sense of what that number is in this area?

  A: Professor Ward's response: He didn´t know that it would have to be as high as three. Three would certainly be in a high enough area to encourage fallowing, but any number significantly higher than 1.0 would likely encourage some fallowing.

Key points: Water banks, if well designed, are immensely powerful for reducing economic damages that occur from drought. The NMSU-published crop enterprise budgets give a good idea of what the regional gains would be if a water bank were used. There are many types of water banks.

Elephant Butte Irrigation District Offset Program

Robert Faubion, Board Member, Elephant Butte Irrigation District

EBID has been working with its constituent farmers to develop a policy to allow Elephant Butte Irrigation District (EBID) water rights use by Municipal and Industrial (M&I) water providers. The intention is to address the close connection between the surface water supply of the Rio Grande Project and the groundwater systems of the Mesilla and Rincon valleys. While administration of water in the area is divided between EBID's management of surface water and the Office of the State Engineer's jurisdiction over groundwater, that division is artificial. EBID's new Depletion Reduction and Offset Program (DROP) provides a transparent mechanism for M&I users to obtain groundwater offsets from willing sellers within EBID having surface water rights and combined groundwater rights. DROP bases the offset not in a specific amount of surface water or groundwater, but on the reduction of depletion by fallowing land that would otherwise be irrigated and depleting combined surface water and groundwater. Very high on EBID's list of priorities is implementing DROP in a manner that protects the viability of agriculture for those lands that remain in production. The DROP plan was developed as one tool to control depletions and increase resilience in the basin. EBID will work with farmers, M&I water users, and the Office of the State Engineer to implement this program in a constructive and hydrologically beneficial manner.

J. Phillip King, Hydrology Consultant, Elephant Butte Irrigation District

The DROP program is unlike other schemes to transfer irrigation water to M&I use. In the other cases we looked at, the objective was to deliver surface water from an irrigation district to a surface water treatment plant for use by M&I water providers. That is not practical for us, because with the unreliable surface water supply we have seen in the past five years, including the worst year in the 100-year history of the Rio Grande Project in 2013, M&I users will clearly remain dependent on groundwater for the foreseeable future. However, that groundwater use depletes the surface water supply of the Rio Grande Project, exactly the problem we are trying to address.

Instead of delivering bulk surface water to a treatment plan, the DROP allows M&I groundwater users to continue or expand their use of groundwater that is hydrologically connected to the surface water supply. By fallowing irrigated land and eliminating the associated depletion of water from the hydrologic system of the LRG, the M&I user can continue or expand depletion while keeping the local hydrology, and the Rio Grande Project, whole. Administrative schemes in the past have tripped over the split jurisdiction over surface water and groundwater. DROP embraces the Surface Water – Groundwater Duality© of the LRG to provide a common currency for managing the interactive water resources of the LRG: Depletion. The irrigated land eligible for the program must have both surface water and associated groundwater rights. The question naturally arises: is this a surface water offset program or groundwater offset program? The answer is yes. It is important to recognize the interaction and switch one's thinking to depletion rather than surface or ground.

This is not a panacea for the LRG's hydrologic and legal woes. It will not, on its own, establish sustainability or resilience in the area's water supply. It is one asset for managing water in a highly connected system. We are not saying whom needs to offset, or how much. This is just the method by which it can be done. Just as a screwdriver doesn't tell you which screw to turn, DROP is a narrowly focused tool. Other events will define whom and how much, and we aren't here to talk about those events.

Lisa Henne, Law Office of Steven L. Hernandez PC, Elephant Butte Irrigation District

EBID will administer DROP, including maintaining records of fallowing agreements and land management plans, ensuring that enrolled parcels are being fallowed, and acting as the fiscal agent for payments to EBID member participants. Implementation of DROP will take time because the Rio Grande Project is a Federal Reclamation Project and is subject to Federal Reclamation Law. EBID has had preliminary discussions with Reclamation officials and have been advised that DROP will require a "1920 Act" contract to change the purpose of use of project water rights from irrigation to use as offsets for M&I depletions. Compliance with the National Environmental Policy Act (NEPA) will also be required. It is unknown how much time it will take to get through NEPA, but two years is probably a reasonable guess. EBID is working with Reclamation to develop a work plan for the steps that will be necessary to implement DROP.

Discussion

The audience asked several questions.

- **Q:** Where is the administrative cost going to flow from?

  A: The administrative costs would be paid by the M&I contractors.

- **Q:** What is the logic behind requiring rotation of the fallow land? For example, if rotational fallowing were not required, parcels could be converted to native grass.

  A: The purpose of rotational fallowing was to avoid permanently removing land from production. However, the Board wanted a policy with flexibility, and the Board has a great deal of discretion as far as giving exceptions. The Board envisions that EBID would work closely with EBID members to address their needs and wants.

- **Q:** Is the contract one year or multiyear?

  A: EBID has not gotten to that level of detail yet, but it is one of the issues that will need to be addressed.

- **Q:** Why would farmers be limited to fallowing 20 percent of their land?

  A: EBID wanted to spread out where these fallowed lands will be rather than having large areas of fallowing that would create difficulties with delivering irrigation water. In the future, EBID may decide that the limit should be higher or lower. EBID would still allot water to the account of the farmer that is participating.

EBID understands there will be situations where it may be more efficient to fallow more than 20 percent of a particular EBID member's land, and anticipates allowing the EBID member to come before the Board to request an exemption. The Board wants to be flexible and to be sure that it makes hydrologic sense. Their policy also includes an option for land owners to form a group and contract as one entity. This would allow permanent crop (e.g., pecan) farmers to participate in DROP by forming a group with other farmers who have the ability to fallow, or for one farmer in a group to fallow more than 20 percent if another farmer in the group wants to fallow less than 20 percent.

- **Q:** The audience also asked a question regarding 2.6 CU per acre. One thing that stood out in Professor Colby's presentation is that you need to look at apples and apples, because it's truly a depletion exchange. The 2.6 CU per acre is the consumptive portion and that also defines the diversion amount. Is this correct?

  A: Dr. King answered, no, that's not correct - 2.6 without a limitation would be counted as the offset.

- **Q:** Another point of the discussion: the DROP might serve as a template for others; is there potential for us to stay informed instead of re-inventing the wheel again?

  A: Dr. King said that EBID will provide local meetings, publications, and presentations.

- **Q:** The audience was interested to know if it would be possible to invite Pecos Valley Artesian Conservancy District (PVACD) to the meetings.

  A: It was expressed that the Board would be more than willing to work with PVACD.

- **Q:** An additional question addressed M&I depletions, and noted that the NM Pecan Growers Association does not support buy-and-dry. How do you see prices and supply stability working out? What is the nature of municipal supply need?

  A: Mr. Faubion's response was that this policy applies only to M&I. It appears there is enough stability for El Paso's needs. DROP would not deliver wet water, but rather allows an existing depletion to continue or a new depletion to start. This is a mechanism that provides enough fallowing to provide for the offset. They know that there is an issue with limited number of bankers and think this issue can be resolved. EBID is not identifying who has to offset or when. This is a tool for water users that will help with diversification. El Paso is a good example. They have many sources of water. This tool will not solve the problem of groundwater stabilization. That's a larger problem.

  A: In addition, Dr. Henne answered that Reclamation will play a major role, and EBID will have to work with Reclamation. Much depends on who is interested and who comes forward to start the process.

- **Q:** Additional questions: Were there any technical information needs that you encountered in this process? Can you think of any science that could improve this process?

A: Dr. King answered that improving the consumptive use would be valuable to EBID. It would be interesting to look at the consumptive use of the land that is in the program. Is the depletion actually 2.6 feet?

Groundwater Sub-district Formation and Implementation in the San Luis Valley in South Central Colorado

Steve Vandiver, General Manager, Rio Grande Water Conservation District
Colorado is known for its groundwater administration. The Colorado Ground Water Law of 1957 established the permitting requirement of groundwater wells, and by 1969, surface and groundwater rights were administered together. Groundwater administration and enforcement is one of the primary responsibilities of the Division of Water Resources, led by the State Engineer. By law, every new well in the state that diverts groundwater must have a well permit. For a long time, the San Luis Valley's water users avoided giving the State Engineer the authority to limit pumping by the valley's roughly 4,500 irrigation wells. Two aquifers supply the water for those wells and help farmers irrigate valley crops such as alfalfa. Both aquifers are hydrologically connected to the valley´s surface streams. The groundwater model has determined what the depletion should be in the stream. The Division has analyzed "shortage versus adapting to changing conditions." One of the keys is measurement via the groundwater monitoring system. During drought, they establish a voluntary approach such as changing crop types that reduces the number of acres in production. The high level of depletion was affecting surface water and, therefore, they developed a program to protect the aquifers. They have established an administrative fee for operating expenses. This fee allows the District to administer the sub-district. An additional fee was established, the CREP Fee, which is a conservation reserve enhancement program cost-share with the federal government to control groundwater in the sub-district. A third fee, variable fee, is calculated on the water pumped per acre-foot based on how many acre-feet each well pumps. These fees limit groundwater extraction and are a new way to improve water efficiency in the area. The concept of conservation and protection of the aquifer has been essential for the region. Since 2011, farmers have reduced their groundwater pumping by 30 percent. The aquifers are very important and they are used very effectively as reservoirs. The overall goal is a sustainable system.

Case Study Nebraska
(Ground)water Trading: What's In It for You

Richael Young, President Mammoth Trading

Ms. Young gave a presentation on how markets can make money for agricultural producers, but emphasized that the design and implementation of markets are essential for participation and efficiency. Mammoth Trading launched the first active "smart market" for groundwater in the world. They have helped farmers trade groundwater in the Twin Platte Natural Resources District (NRD) in Nebraska starting in 2014 and the South Platte NRD in Nebraska since 2015. Groundwater markets can be used for many management challenges, including groundwater depletion, stream depletion, well interference, and water quality. The key points of her presentation were that (1) markets provide a new revenue stream and risk management tool by monetizing water, (2) not all “markets” are created equal, which has serious implications for market participation and efficiency, and (3) the regulatory and financial sides of trading should be separate, since regulators have a stake in the outcome and cannot ensure neutrality in operating a market. To illustrate how each market type differs and whom each favors, Ms. Young ran an interactive simulation of trading mechanisms: decentralized brokerage or “coffee shop” markets; bulletin boards; auctions; and “smart markets.” Smart markets provide a centralized hub for trading, automate regulatory compliance, and maintain anonymity and confidentiality of financial information. Through the simulation, participants identified the following challenges in trading groundwater rights: identifying an interested party, negotiating a price, and obtaining regulatory compliance. Smart markets offer a clear solution to these issues. In addition, farmers have concerns about disclosing the value of their water, which could potentially be used against them in the future. As a result, government-run markets are likely to limit participation. This can be resolved by having a neutral third-party operate the market.

Discussion

Ms. Young answered several questions from the audience.

- **Q:** Farmers could do this themselves, but how is it that Mammoth Trading reduces the costs?

  A: Ms. Young answered that smart markets reduce the hassle of the trading by pooling many interested parties together and finding the best matches among them. They charge for their service, but farmers are not obligated to use it.

- **Q:** An additional question was about an example of how regulations have been made easier. Are there better ways to regulate between an irrigated area and extraction volume? What have you seen that has been better or easier?

  A: Ms. Young answered that it depends on what is going on the ground. If you have a fairly homogenous crop-scape, the water use requirements are about the same across fields. As a result, you can simply manage irrigated acres. This approach allows a regulator to make a rough guess on how much water is used per acre and not incur the costs, financial and political, of installing and annually reading meters. However, if there is more heterogeneity in water application or more political will and staff resources, then you might consider meters and volume-based regulations.

- **Q:** Another question was about transaction costs; is Mammoth Trading’s service a one-time fee?

  A: Ms. Young answered that Mammoth Trading charges a percentage fee of the total sale price of executed trades; there is no cost to place a bid or offer.

Case Study Nebraska
Nebraska Local NRD Management and Water Banking Programs

Dean E. Edson, Executive Director, Nebraska Association of Resources Districts, Lincoln

Mr. Edson addressed in his presentation the Nebraska Natural Resources Districts (NRDs), Nebraska Water Law, Nebraska Water Challenges & Banking Programs, and future issues. In April 1969, four senators introduced LB1357 in order to consolidate 154 special-purpose districts into a series of multipurpose districts based on river basin boundaries. The law became effective in 1972. Nebraska has 23 Natural Resources Districts. Locally elected boards and any eligible voter can run for office - not like an irrigation or county conservation district where you have to be a vested landowner to get on the board and the general public votes, not just the landowners. Farmers, ranchers, bankers, agribusiness owners and employees, business owners and employees, and teachers and nurses are just some of the current elected directors. NRD has 12 statutory responsibilities among the most relevant for water management are water supply for any beneficial uses, development, management, utilization, and conservation of groundwater and surface water. Several NRDs own and operate Rural Water Systems for domestic water supplies paid for by the users. The NRDs also have taxing and regulatory authorities. The water is owned by the state and is dedicated to the people of the state for beneficial purposes. Permits are granted for use by the Nebraska Department of Natural Resources (NDNR) and local NRDs.

Different doctrines and laws apply depending on the use. Surface water is on the Prior Appropriation Doctrine managed by the State of Nebraska where senior users get all of their rights first. Groundwater is on a Correlative Rights Doctrine managed by the local NRD where all users share equally on shortages. The NRDs can set annual groundwater allocations to address declines and/or shortages. The Republican River Basin as one of the most stringent groundwater allocation systems in the nation (Six to fourteen inches/acre/year depending on the area). The Preference System applies to all – 1) Domestic, 2) Agriculture, 3) Manufacturing, and 4) Other. Payment is required for most subordination agreements. NRD programs – every NRD has a groundwater management plan for quantity and quality. Every NRD has a variance request process to allow farmers to transfer groundwater rights within the NRD. The landowner can transfer to another parcel he/she owns or it can be between landowners. Each NRD has rules and requirements for such transfers to meet local conditions and management plans. Integrated Water Management Plans (IMPs) are joint water management plans with the Department of Natural Resources (state agency) and the local NRD to manage surface water and groundwater conjunctively in the basin. Where a basin is not fully appropriated, districts can create a Voluntary IMP with the state. Twenty-one of the twenty-three districts have or are developing IMPs. The First Water Bank was created by the Central Platte NRD 2007 and over 3,000 acre-feet of water was purchased by the CPNRD from willing sellers in the basin and banked for the Platte River Recovery Program and other future uses. The CPNRD is responsible for reducing water consumption and returning flows to the Platte River for the Platte River Recovery Program and getting the Platte River back to being fully appropriated. The CPNRD has also spent over $7 million to partner with four irrigation canal companies to jointly rehabilitate and manage existing surface water irrigation canals. Landowners are allowed to use groundwater for irrigation. The excess surface water rights are used to return the over-appropriated area back to a fully appropriated status. The result of the four joint partnerships are up to 30,000 ac-ft of water annually returned to the Platte River with no reduction in irrigated acres. The CPNRD is also working with DNR and a consultant to develop a web-based program so farmers can go online and market or transfer groundwater rights. The site should be available in 2016. The NRDs also use an Occupation Tax of up to $10/irrigated acre to develop stream-flow augmentation projects. Bonding can be utilized with the Occupation Tax. Over 18,000 irrigated acres in the Republican and Platte River Basins were purchased (primarily from two large landowners) by the NRDs and converted back to native grass. Water previously used for groundwater irrigation is banked in normal years (average three out of four).

For Republican River Compact water short years, the groundwater is pumped to the river for delivery to Kansas water users (average one out of four). The groundwater pumped is less than the amount used by the previously irrigated crops. The parcels and projects are owned and managed by the NRDs. Part of the project is in the Platte Basin and owned by the Twin Platte NRD. That portion will be used by the TPNRD for Platte River Recovery obligations. The Niobrara Basin NRDs just purchased a senior existing hydro power right in the Niobrara River to convert some to an instream flow right for the Nebraska Game and Parks Commission, protect other existing uses and is banking the remaining for future uses. The Niobrara River has a 76-mile stretch declared as a Federal Scenic River, Nebraska is #1 in irrigation and their groundwater levels are at pre-development levels because of local NRD management efforts and IMPs.

Discussion

Mr. Edson answered questions from the audience.

- **Q:** Where does the money come from and who gets it?

  A: Mr. Edson's response: Property tax levy on all taxable property in the district: residential, industrial, and agricultural. The NRDs have up to 8.5 cents per $100 of valuation levy authority. The funds raised are set by the local NRD and are used for resources management activities/projects.

- **Q:** Another question was about groundwater management tax.

  A: The NRDs can impose an Occupation Tax up to $10/irrigated acre on irrigated land. Dry land and commercial property are not included. The tax rate is set by the local NRD and the money goes toward the augmentation projects. The other property taxes go toward flood control projects, canal rehabs and other resource management projects. Everyone that owns property subject to taxation is subject to NRD taxes.

- **Q:** Another question: How would you compare that to what Steve Vandiver reported?

  A: Mr. Edson- The tax rate is set by the NRD and the county accessor/treasurer collects occupation tax at the same time that property taxes are collected. The occupation tax is subject to a tax lien just like property taxes. The NRD pays the county a collection fee just as all other political subdivisions do in the county (e.g., schools, cities, etc.) for both occupation and property taxes.

Case Study Kansas
Central Kansas Water Bank Association

Orrin Feril, Manager, Central Kansas Water Bank and Big Bend Groundwater Management District #5, Stafford, KS

Mr. Feril provided the background about the statutory requirements for a water bank in Kansas. The Water Bank must have a valid charter with the state to operate. In addition, it must have a minimum 10 percent water savings through the activities of the bank. K.S.A. 82a-761 *et seq.* The Charter must define conservation goals, bankable water rights, hydrologic units and associated guidelines, set procedures for programs, deposit for lease, and savings account. The amount of water that is bankable is: the average water use (1987-1996). There is a conservation component applied to the amount leased from the bank depending on four unique criteria. These criteria are the average saturated thickness, water level decline, distance from the stream, and sustainable yield at the specific location. This is a successful water bank that is working with stakeholders and the various state agencies to provide area producers with flexibility tools that have already taken water conservation into account. Each water bank is reviewed every five years by an independent review panel of water experts from across the state. Within one year, they issue a review report that determines overall compliance with existing statutes, rules and regulations, and the bank's charter. Additionally, they report the impact the water bank had on hydrology and any other matter the review committee deems relevant.

Discussion

Mr. Feril answered several questions from the audience.

- **Q:** One question concerned a specific map within his PowerPoint slides and the meaning of the gray areas. Are those gray areas where you are not allowed to bank and not allowed to lease?

  A: Mr. Feril's response was that they don't care where the water is coming from and it can come from anywhere in that sub-basin. That map depicts the conservation component applied to the lease side of the transaction. The green areas are more stable areas and have a lower percentage for the conservation component. The red areas are those that are more marginal and have a higher conservation component applied. If the area is gray, the water bank prohibits water from being leased into those areas.

- **Q:** Another question was about the savings account. Is there a cost to participate?

  A: Mr. Feril answered that the water bank is a fee-based not-for-profit corporation. The cost for the savings account was changed in 2013. It had been $1,000 per account and now it is $100 to open an account. That is a flat fee. When you pull water out, there is another fee. There is no term limitation. If you never pull water out within ten years, there will not be another fee assessed during that time. There is a 10 percent conservation fee on any remaining balance of water at the end of each calendar year. If you want to maintain a balance, then you do not use your full amount of water. They operate on a calendar-year basis; the State of Kansas requires a report on March 1 for the year previous, so the water bank adopted the same reporting period. The deadline to open a savings account is December 1 every year.

Case Study Kansas

Richard Wenstrom, Irrigator, Central Kansas Water Bank, Kinsley KS

Mr. Wenstrom presented several questions at the beginning of his presentation related to the development of the Central Kansas Water Bank. How did it get established? What situations led to this concept? Why was the Central Kansas Water Bank initiated? Who were the players in the bank's establishment? How did the bank function? What were some of the problems? Mr. Wenstrom also showed the location of the groundwater aquifers in Kansas, the Ogallala Aquifer in western Kansas, the Great Bend Prairie Aquifer in central Kansas, and the Equus Beds Aquifer in east-central Kansas. The Ogallala Aquifer represents the major source of groundwater. Mr. Wenstrom showed a map of Groundwater Management District # 5, and stated that his talk would be confined to this area of the state.

It all started on Walnut Creek in the late 1980s. Surface-water user Cheyenne Bottoms Refuge had conflict with groundwater irrigators along Walnut Creek – Cheyenne Bottoms Refuge has a high priority water right. After hearings, Kansas Chief Engineer initiates an "IGUCA", or Intensive Groundwater Use Control Area whereby irrigators' water was reduced in 1992. The Water Protection Association of Central Kansas (Water PACK) was formed in 1990. Rattlesnake Creek Sub-Basin has nearly 2,000 groundwater rights, most of which are junior to Quivira National Wildlife Refuge. Drought hit the whole area in 1991 and 1992. Quivira NWR notes lack of water in the early 1990s drought……starts dialogue with users. Water PACK wishes to avoid another IGUCA. Formal Partnership Agreement (partners were Water PACK, GMD # 5, Kansas Division of Water Resources, and U S Fish & Wildlife Service) was signed in June 1994. The purpose was to ensure "adequate water for all users, profitable agriculture, abundant wildlife and habitat, and an acceptable standard of living for all sub-basin residents." The Kansas Division of Water Resources initiated the Sub-Basin Water Resources Management Program to assist the process. The idea of a water bank was one of seven water conservation measures developed by the Partnership in their Management Plan starting in 2000.

Meanwhile, water banking in Kansas appeared in the State Water Plan in 1995, and a task force was set up to develop a plan for a water bank. This task force recommended one groundwater bank in the state. Water PACK worked with other ag groups and lobbied in the Kansas Legislature during the 2000 and 2001 sessions before the Water Banking Act was passed. This Act specified the creation of one groundwater bank in the state. A Water Banking Committee within GMD # 5 was formed to draft a charter for the Central Kansas Water Bank. This draft charter was completed in 2002, and the Chief Engineer approved the charter in June of 2005.

Water PACK and GMD # 5 helped promote the new Central Kansas Water Bank, but with mixed results. Participation was limited; irrigators did not understand the bank. In addition, the fees and conservation components were such that participation was actually discouraged.

The First Evaluation of the Central Kansas Water Bank took place in 2010. Happily, the recommended changes made by the evaluation committee, if approved, would fix the problems with the fees and conservation components to make the “new” bank very user friendly. Furthermore, the committee recommended that the bank be made permanent.

In 2012, the Kansas Legislature approved all of the Evaluation Committee recommendations. The Central KS Water Bank Association Charter was revised to reflect these changes. The Water Bank is now actively used; Water PACK is helping promote the CKWBA. The water bank has “money in the bank” from fees, has repaid the initial loan to GMD # 5, and is now able to stand on its own.

Discussion

Mr. Wenstrom answered several questions.

- **Q:** Who was against your bank?

  A: Mr. Wenstrom’s response was that no highly significant people were fighting them.

- **Q:** Why did the water banking law go down to defeat in 2000?

  A: Response was that Water PACK and others just didn’t educate enough in the beginning and during the legislative session.

- **Q:** Another question was about customers: Are they folks who want to be regulated or curtailed or are they brand new?

  A: Mr. Wenstrom’s response: All of the above. There are new users that will come because we have sustainable water.

- **Q:** An additional question from the audience: What’s your certification process for water rights?

  A: Mr. Wenstrom’s response: An application is completed and it’s time stamped and given a priority number. An applicant then receives an approval letter with a timeline and the applicant is watched for five years. You must divert water for beneficial use. At the end of five years, the State comes to your pumping location and runs a test on your installation to determine your normal flow rate and does a review. If abnormal results are found during this test, test personnel are strictly forbidden from giving advice on correcting the abnormalities. From the results of this test, the State issues a draft water rights certificate, which ultimately becomes the actual water right.

- **Q:** And a final question: What does water deposited into the water bank lease for?

  A: Mr. Wenstrom’s response: $75 an acre-foot. He personally would take $350/acre-foot, before he would consider depositing water from an active water right on a good corn circle.

Not enough people know about the water bank. They are starting over now to promote and support the "new" bank. Exciting opportunities lie ahead for the bank.

Wrap-up Panel and Key Insights

Bonnie Colby (University of Arizona), Erek Fuchs (EBID), and Mike Greene (PNM)

Bonnie Colby

The goals that Professor Colby addressed concerned local problem solving and addressing issues related to groundwater and surface water connectivity. This workshop has been an opportunity to study ideas from other systems and how the flexibility offered by water banks applies to them.

The key elements that Professor Colby analyzed were water price mechanisms, creating an effective mechanism to offer and acquire replacement water during times of curtailment, and the development of the water bank.

Professor Colby closed the session with "Achieving more extensive trading in water across locations and uses is like getting to heaven. Many water managers do want to get there, but not too fast."

Professor Colby also provided key inputs about the wrap-up panel:

Key emphases for a path forward:

Flexibility is essential: start a pilot program, collect data on what happens, learn, and adapt.

A water bank is custom-crafted to address regional problems.

Water banks assist with local problems and focus on solving challenges unique to an area.

The EBID offset plan framework is now available for dialogue and includes a number of very intelligent features and ability to learn and adapt over time. However, lots of details remain to be worked out.

Two critical issues in any water trading system:

1. EBID made very specific statements during their panel on the ratio, how they want to handle CU issue as land is fallowed and made available to M&I
2. EBID plan's pricing mechanism is to be determined; it needs to balance incentives to farmers while keeping cost of replacement water reasonable for M&I

Erek Fuchs

Mr. Fuchs noted Professor Colby's positive remarks regarding the EBID's recent policy concerned with reducing depletions in the Lower Rio Grande. In addition, he accentuated that significant hydrologic issues related to conjunctive use must be addressed, and mentioned Steve Vandiver's presentation as an example of sustainability in interrelated surface and groundwater systems. Mr. Fuchs also mentioned Professor Frank Ward's presentation highlighting the need for more complete adjudication of water rights. He concluded with the expression "local solutions to local problems."

Mike Greene

Mr. Greene talked about the need of working together to solve our problems by ourselves. Different experiences can provide ideas in order to provide an efficient water bank. We have worked with the LRG group to solve our problems here in the Lower Rio Grande by ourselves, so the diverse thinkers help to start the conversation on how best to address the water bank and our needs. Mr. Greene said “It is not an easy path so don’t walk out having a dream that this is going to be done quickly, but I have no doubt that we can achieve it together.” He encouraged people to get ideas that can be brought to the table. He also pointed out that the good news was we are not the first to do a water bank, but the bad news was ours will have to be custom fit – and that will take time and commitment.