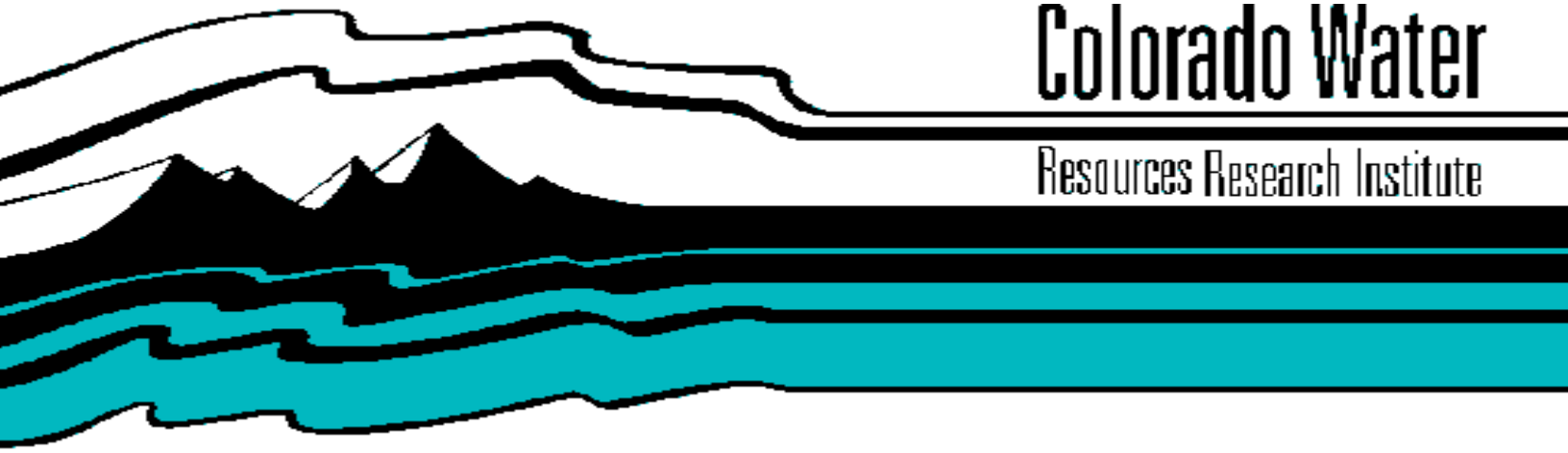
Arkansas River Basin Water Forum
"A River of Dreams and Realities"

Proceedings of the 1996 Arkansas River Basin Water Forum
January 3-4, 1996



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Colorado State University

Arkansas River Basin Water Forum
"A River of Dreams and Realities"

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James S. Lochhead, Executive Director
Colorado Department of Natural Resources

I really appreciate the opportunity to be with you because I think that this last year has been a year of tremendous activity and really significant progress in the Arkansas basin. At the beginning of this new year we have an opportunity to reflect on what we have achieved and look forward to the next year and to what's ahead of us.

I want to congratulate those of you in the basin for what I believe has been enormous progress in dealing with a lot of difficult issues in the basin. At the same time, we need to build on that progress and remain focused on the task at hand, remain committed to our goals and moving forward. You have heard and will hear today and tomorrow about many on-going activities, including the status of the Kansas vs. Colorado litigation, the progress on rules and regulations by the state engineer, our efforts to achieve a new state park in Southeastern Colorado and the Smart Growth Initiative that we've all been working on over the last year. And I want to touch on each of those issues, but first I'd like to set the stage a little bit and look at what we've done over the past year.

First, in the area of water, in August, 1994 the Governor established by executive order the Arkansas River Coordinating Committee. The premise of that committee was that the best way to resolve problems and issues is in an open and thorough atmosphere of communication and collaboration. We wanted broad representation from both the upper and lower basins, from both ground water users and surface water users, and from both agriculture and municipal users. The purposes of the committee were to advise and coordinate with the state engineer's office on the development and implementation of rules in the administration of ground water in the basin, to provide recommendations to the state on an appropriate remedy for past depletions to useable state line flows in the event that U.S. Supreme Court found liability for Colorado (and of course, the court did find such liability), and to recommend and support the efforts of the Department of Natural Resources, the Division of Wildlife, and Division of Parks and Outdoor Recreation in our efforts to accomplish water, wildlife and recreational objectives at Trinidad Reservoir, and Great Plains Reservoir in particular.

Over the last year, the ARRC has had numerous meetings and discussions on the issues put to it by the Governor. I want to recognize the time and outstanding effort that was put into this committee by its co-chairs Chuck Lile, Director of the Water Conservation Board, and Hal Simpson, the State Engineer. In August, the ARRC made a report of its recommendations. Although there are disagreements and there are many issues that still need to be resolved, I believe that the report demonstrates an unprecedented level of communication, coordination and consensus among the many diverse issues in the Basin on many difficult and controversial issues. The report recognizes that there is a need for the Arkansas Basin to pull together to deal with those issues.

In summary, the report made recommendations in the areas of recreation, water acquisition and augmentation. Those recommendations will be important to the state as we continue to move forward to resolve these issues. As you know, the Supreme Court dismissed two of the three claims that Kansas brought against Colorado, but held that Colorado does have liability to Kansas for the depletion of usable state line flows as a result of post-compact well depletions. Colorado has been aggressively and well represented in this litigation. When trial began in 1990, the Kansas claims totaled in excess of one and a half million acre-feet for the period of 1950-1985. Through the process of trial that claim was reduced, and recently Kansas and Colorado entered into a stipulation that puts the total liability for post-compact well depletion for that period at about 328,000 acre-feet. I applaud the fact that the attorneys representing both states were able to reach this agreement. Colorado has, throughout this litigation, been willing and anxious to reach agreement and settlement of the claims by our neighbors in Kansas, and we remain willing to sit down with Kansas officials and negotiate a reasonable settlement. I also want to emphasize that the Special Master fully expects that Colorado will aggressively pursue the implementation and enforcement of rules to assure future compliance with the ruling of the Supreme Court. The Master denied a Kansas motion to limit pumping in Colorado to 1,500 acre-feet a year but at the same time emphasized that the Supreme Court may order steps if we don't make adequate progress. He stated, and I want to quote from his ruling because I think it is important, that "Colorado recognizes that I may recommend and the

Supreme Court may decree whatever steps are necessary to achieve compliance. There is no prohibition against my imposing management standards upon Colorado should Colorado fail to do so through its own processes."

This ruling underscores the importance of our working together as Coloradans to do what is best for the Basin. That continues to be the goal of the state. I know that is a goal of the water users in the Arkansas Basin. I look forward to continued progress and a good working relationship in the year to come.

I think we also made a lot of progress in the area of growth. As you know, we've been working very hard over the last year with the Governor's Smart Growth initiative on two parallel processes. One was a process of regional coordination and a visioning process to look at what is important to each of the diverse areas of Colorado and try and formulate a plan for the future and a pathway to achieve that plan. The second parallel process was a working relationship that the Governor established with representatives in each of the regions of the state through what we call the interregional council.

In the lower Arkansas Basin, there were a number of priorities that were identified, including economic development, providing quality health care services, emphasizing the important role of the three community colleges in Southeastern Colorado, developing a firm direction on water supplies, dealing with the affordable housing issues in this area and looking at the transportation needs including the prospects for rail line preservation in the important economic role the rail line has to this basin.

In the upper Arkansas Basin, the priorities that were identified include a diversified economy, enhancing the communication technology in the upper basin, maintaining a sustainable agricultural production, again looking at transportation needs and the need to preserve the rail line and affordable housing and the relationship that the upper Arkansas basin has to ski areas in Summit and Eagle counties.

Both the interregional council, the statewide council and the regional councils provided a number of recommendations including recommendations for legislation, executive branch, policy and local action. I'm going to talk a little bit about the process that we hope to undertake in conjunction with local areas in a minute. That's kind of, in a nutshell, what we've been doing -- the major issues we've been dealing with over the past year. And, again, I think we've made a tremendous amount of progress in those areas. What can we look forward to in the year ahead?

I want to talk about, again, four areas. First, Smart Growth; second, the progress that I hope we can make in the next year toward our goal of a new state park in southeastern Colorado; third, what we need to do to implement the state engineer's rules in the basin; and fourth, some legislation that we are looking at to provide the tools necessary for us to move forward in the water area.

In the area of Smart Growth, we will be pursuing all of the ideas that were recommended by the interregional council. There were 70 some recommendations that came through that state-wide process and I'm going to talk about a couple of those specifically. Again, they represent legislative action, executive branch action and local action. The Governor has already issued an executive order directing all executive branch agencies to align their policies and processes to the greatest extent possible with the regional visions. His goal throughout this process was a bottoms-up process where state governments and local areas would be aligned together on the same page in the same directions toward the visions that were established in these regional conferencing efforts, and he has backed that up through an executive order directing state agencies to do that on the ground. Hopefully, that will result in some continued close communication and cooperation between state agencies and local governments.

The Governor, as you know, appointed a blue ribbon transportation committee and that committee has been looking at the difficult transportation issues that we have in this state.

Another issue that has come up through the process was an initiative relating to the State Land Board. The State Land Board is currently composed of three full-time, paid commissioners who are appointed for six-year terms. Those commissioners manage 3 million surface acres of land under a constitutional mandate established 120 years ago at a

time when the income from state lands provided 100% of the support for public schools and at a time when the federal government was seeking to encourage the settlement of the new frontier. Today, obviously, with the growth issues that we face in Colorado, we're not looking to settle all available lands in the state and the income produced off state lands encompasses about ½ of 1% of the total state education budget for K-12 education. But the constitution says (again, it was adopted 120 years ago) that the State Land Board needs to obtain the maximum possible amount of revenue from the management of those lands. That management directive often conflicts with local visions, local land use priorities and the use of existing leases on the land.

A year ago, the Governor asked the State Land Board to conduct a comprehensive study of its processes and the way it does its business. And, the Land Board contracted with the Natural Resources Law Center at CU to do that. Last fall the study was released. It provided some 29 recommendations about changes in the way the Land Board should do its business. The Governor and I both fully support those recommendations and are working with the Land Board to implement those. However, the Governor feels that not all of this, the new directions, can be established under the existing constitutional mandate. We're interested in two specific issues. One, I believe it's important to broaden the State Land Board from three full-time commissioners appointed for six-year terms to a citizen board structure that would have more commissioners with broader representation of the interests that are affected by state land management. Those include education, agriculture and local government as particular interests that should be specifically represented. The second aspect is to broaden the mandate and the mission of the Land Board to be more responsive to the values in Colorado today. State lands still need to generate revenue for the support of K-12 education but I believe that state lands should be managed in a way that is more consistent with working with local school districts -- for example, in siting school buildings on state lands, or addressing the impacts development of state lands has on local school districts. Those lands should be managed with a view toward long-term sustainable production, and that includes working with agricultural lessees to preserve agriculture production on those lands. Those lands should be managed to be consistent with local land use regulations, land use processes, and the values that are established in local land use plans. And, they should be managed consistent with the desires of local areas for open space and other uses of those lands. I think all those things can be done through a broadened mission of the State Land Board while still generating a significant amount of revenue for public education.

Senator Tebedo has obtained a bill title for the legislature to do a referendum for a ballot initiative this fall and I hope the legislature takes a very serious look at this issue. I would hope and encourage those of you who are interested in this issue to express your input to me directly, to your local representative and those who are interested in state land management. I think it's a real important issue. Again, for the future of this valley, there is a lot of state land in the Arkansas Valley that is very critically located, and I think it's important that you in the basin have a direct voice in how those lands are used and managed.

The next thing I want to talk about in the year ahead is the issue of the development of a new state park in southeastern Colorado. A few years ago, the Governor formed the Lower Arkansas River Commission to look at the recreation needs of southeastern Colorado. That Commission made a number of recommendations that have been supported by the Governor and the Department of Natural Resources since that time. Included in those recommendations is the recognition that many water issues in the basin, including the resolution of the Kansas litigation and internal water issues in Colorado, need to be resolved and will affect our progress in reaching our goal of the new state park. Since the time of those recommendations, our focus has been in two primary areas: (1) moving water to Trinidad Reservoir to increase the recreation pool; and (2) stabilizing the water levels in the Great Plains Reservoirs to make it possible to establish a new state park.

I am pleased to report that we are at long-last making substantial progress through the Arkansas Compact Administration in resolving the issues surrounding Trinidad Reservoir. I want to recognize the cooperation of the officials of the Corps of Engineers, the Bureau of Reclamation, and officials in Kansas in helping us achieve this progress. I hope that next year we will be in a position to move water into Trinidad for recreational purposes and realize a long- held goal in that regard.

We've made less progress at the Great Plains Reservoirs. The Lower Arkansas River Commission recognized that stabilizing water levels in the reservoirs is a prerequisite to the establishment of a state park. Ron Desilet, the regional manager for the Division of Wildlife, and officials of the Amity Canal Company have been involved in extensive good-faith negotiations to achieve agreement on stabilizing water levels. I want to recognize the efforts of those individuals. One of the major issues has been whether water court proceedings will be necessary to accomplish that goal. In mid-December, I asked the Division of Wildlife, in consultation with the Attorney General's office and the Amity Company, to quickly work and explore alternatives to achieve agreement. I think both sides need to be open to looking at all alternatives to accomplish our goal. I also emphasized a number of important elements in reaching that agreement from my perspective.

First, the state will negotiate for fair value for the rights that are received. The agreement must be justifiable to the public from a business perspective, and we must have firm legal arrangements in place that assure that water will be operated as contemplated.

Second, although I appreciate that we cannot control objectors in water court, for those who might choose to challenge the agreement, the agreement should not subject the state and water users in the Arkansas Basin to extended litigation.

Third, we cannot undertake an agreement that will subject the state or water users in the basin to liability under the Arkansas compact.

Fourth, the implementation of this recommendation will require broad support and cooperation from the public, public officials and water users in the basin. It is not something that the state can just do.

From the state perspective, however, we are fully committed to this project. I believe that we can build on the constructive dialogue we have established with water users in the basin through the Arkansas River Coordinating Committee and other forums and get this project done, and again, we're fully committed to doing this as quickly as possible.

The next topic I'd like to touch on in looking ahead to the next year are rules that will be issued by the state engineer. In September the state engineer filed with the water court proposed rules to regulate tributary ground water in the Arkansas basin. I talked earlier about the importance of timely finalization and full implementation and enforcement of these rules. Eighteen protests were filed in water court. However, unlike in 1974 when the state engineer attempted to amend rules in the basin, many of those protests were filed in support of the rules. Most of the major water organizations, including the Upper Arkansas Water Conservancy District, the Southeastern Colorado Water Conservancy District, the Arkansas Valley Ditch Association, the Colorado Water Protective and Development Association, the Lower Arkansas Management Association, and the Arkansas Ground Water Users Association either support the rules or did not file a protest. The state will request an expedited hearing on these rules so this process will not be delayed. I want to recognize the outstanding efforts of the state engineer, Hal Simpson, and the water users in the basin in working together to achieve a remarkable degree of consensus on some very difficult and tough issues and in coming to consensus on these rules. It's something that really nobody likes to do but I think everybody recognizes that it's something that is necessary for us all to do. They've gotten at the task and, I think, moved forward in really an admirable way.

Finally, I'd like to talk about some proposed legislation that we will be looking at in the upcoming year. In order to implement the recommendations of the Arkansas River Coordinating Committee, Chuck Lile and Hal Simpson have been working with water users on proposed legislation to solidify the direction that we are taking in the basin. This legislation will be called the Arkansas River Compact Protection Act. We feel that the Act is very important and will do a number of things for the basin. First of all, it will provide state support for efforts of water users to achieve compliance with the new rules of the state engineer. Second, it will give the state engineer additional enforcement authority. Third, it will give the Division of Wildlife more time to complete arrangements on the Great Plains Reservoirs. Fourth, it will give the state additional authorities to comply with the decree in the Kansas v. Colorado litigation. And finally, it will give the state authority to participate in channel improvement activities below John Martin Reservoir. This legislation is important in that it will give legislative support and authorization for the activities of the state and water users

organizations in the basin. It will also give us the resources necessary to do the job. And, it will demonstrate to the Special Master Colorado's continuing commitment and our ability to achieve full compliance with the orders of the Supreme Court as quickly as possible.

I think you will agree that together we have accomplished a lot in the Arkansas Basin. We still have much work ahead of us. But, we have proven that through cooperation and communication that we can establish and realize mutual goals. We can preserve the values of the Arkansas Basin as a proud, unique and important part of Colorado. I look forward to working with you to make sure that in 1996 we build on our past success, confront the difficult issues we face, and achieve positive and long-lasting results for the people, economy and environment of Southeastern

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A: The representation on the Arkansas River Coordinating Committee is broadly based. It is involved mostly with County Commissioners and representatives of water users organizations because those are the groups that are dealing with the rules and regulations of the administration of water in the basin. The Division of Wildlife has been working directly particularly on the Great Plains Reservoir. One of the goals that we have in terms of stabilizing reservoir levels at Great Plains is maintaining wildlife values at the Great Plains Reservoir site, and it's also an important element on Trinidad Reservoir. So, I hope that through the Division of Wildlife those environmental values can be preserved. As we deal particularly with water issues and growth issues in the basin, the management of state lands, open space and wildlife habitat values are likewise extremely important. So, I think the process of the Arkansas River Coordinating Committee, the Smart Growth regional forums that have been developed through our initiative should have, hopefully, adequate environmental representation. If they don't, then I think it's important that environmental organizations become involved through those local efforts.

Kansas/Colorado Compact?

Chuck Lile, Director
Colorado Water Conservation Board

This morning we will walk you through some information on the Arkansas River Compact. I spent some time these last two days reading over the compact and also looking over the Special Master's decision. But, first as a preface, all my remarks will be corrected by our attorney who will speak after lunch. I have distributed some outlines of the speech along with some related history and salient provisions of the interstate compact. I would like to regress a bit and describe to the audience what a compact is, particularly for those of you that are not familiar with water terminology.

An interstate compact is an agreement that has been reached between two or more states in regard to water, the operation of a river system and how that river system is to be apportioned to protect the interest of those states. Compacts are entered into, and particularly in this case the Arkansas River Compact, through Congressional and state authorization. The compacts must be ratified by both state legislatures. They also must be ratified by the United States Congress and, in fact, they become law in each state and a law of the United States. When two states are in a controversy, they can only deal with the disagreement by compacting or litigating. Under our Constitution there are provisions for how to enter into agreements between two or more states.

With regard to recent history, the Special Master said that the meaning of the Arkansas River Compact cannot be fully understood apart from the rich history of the controversy over the river and early efforts to apportion its waters between the two states. Certainly, I feel that you have to look at the history of an issue and understand the background of how we got from point A to point B before you can fully understand the issues. I initially was going to begin the history of the compact from 1861 until I was reminded about some earlier history in the Arkansas Basin; in particular, about the time period when mountain men were coming into the Arkansas Basin at Bent's Fort, one of the first settlements. During that same time period, irrigation was being done by the Spanish settlers and Indians that were living in the basin along the Arkansas River. In fact, I have been reading a history of the City of Pueblo, and have found that the early Mormon settlers, as they were moving west to Utah, actually learned to irrigate by working with settlers along the banks of the Arkansas that were near Pueblo before they moved to Utah. So, the history of irrigation in the west has been greatly influenced by what occurred back in the early 1800s on the Arkansas River.

Kansas reached statehood in 1861. One of the things that sets Kansas apart from other states is that it has two types of water supplies. In the east, there is an abundance of water through rain; however, as you move further west Kansas becomes drier. In the 1800s most of the people settling in the west were from the east or even Europe. They relied on rain and were not used to the idea of irrigating. They brought a system developed in the east called "The Riparian Doctrine," which held that if you lived along the stream, you had a right to use that stream, but you could not deplete the stream by using water consumptively. You could be watering your livestock or drinking out of it, but you were not diverting it and irrigating with it, hence reducing the amount of physical supply. This type of doctrine was developed in the east since there was an abundance of water supply. However, with the advent of mining, the history of irrigation and the arid nature of the West, we have taken water from the streams and moved it great distances to irrigate fields and raised crops. We have taken water from the streams and used it for mining purposes.

The Prior Appropriation Doctrine came from some of the disputes that occurred in California in 1849 and later in Colorado when people rushed to California to develop mining. Often these disputes arose concerning how to utilize the water of those limited stream systems. Miners' courts were set up to settle these disputes. The courts dealt with how much water you were allowed to use from the stream by establishing a principle of "First in time, first in right;" hence, the Doctrine of Prior Appropriation was founded and later that concept was brought to Colorado with the advent of the mining industry. Of course, it further went on to apply to irrigational practices.

Oftentimes fights were settled a lot differently. Interestingly enough, I was reading excerpts from the Supreme Court decision on the Arkansas River. It stated if the issue was not between two states, but between two private parties that were fighting, the issue would probably be settled by force. Oftentimes this was the case in the early history of the West.

The court noted that this being a dispute between two states, they had jurisdiction to resolve the issue. Consequently, we find ourselves before the U.S. Supreme Court in today's ongoing dispute with Kansas.

As development was occurring in both states on a parallel timeline, irrigation ditches were being constructed not only in Colorado, but also in Kansas. For those of you familiar with the Pueblo area, the Bessemer Ditch irrigates the St. Charles Mesa. For those of you from the Rocky Ford area, you may be well aware of the Rocky Ford Ditch. Both of these ditches were developed in early 1870. About 1901, Kansas brought suit against Colorado. It was the first interstate stream suit brought to the United States Supreme Court. The United States Supreme Court declared they had jurisdiction in the matter. In 1907, the Supreme Court ruled that there was an equitable use of water in Colorado and that Kansas had not proven their claim. There had been construction and completion of ditches in Colorado. However those operations had not diminished opportunities for Kansas to develop and use its water resources to such an extent as to require Supreme Court jurisdiction. The water users in Kansas didn't particularly agree with that decision and they filed private suits against water users in Colorado in 1910. There was a compromise reached between these parties in 1916. Although the compromise was agreed to among the parties, other groups in Kansas did not agree with it, and they again brought suit.

The states tried to work through a process of negotiating a settlement in the 1920s. One of the key leaders was a gentleman by the name of Delph Carpenter, whom you may have heard of. He also worked on other compacts including the Colorado River Compact and the La-Plata River Compact as well as the South Platte Compact. He worked on the Arkansas River and tried to reach a compromise whereby there would be a certain amount of water for the ditches and existing users would be established in each state. The compromise would have given Kansas an opportunity to build a reservoir for their use on the Purgatoire River system. That proposed compact was circulated between the states and interested parties and it was not accepted; it was rejected and never went forward.

In 1928, Colorado brought suit trying to, in effect, stop Kansas' continued litigation over the river and pointing out to the Court that it had settled this issue before. Around 1928 people started thinking, "Well, there ought to be some way we could solve these problems," and they began to look at a project in Colorado called the Caddoa Project, known now as the John Martin Reservoir and Dam. They knew that a major project at this location could not succeed without federal support. Both states needed to join together in political support of the project. In 1936 they were able to get authorization for construction of the project; however, World War II delayed activities in the project. In 1943, the Supreme Court case that had been filed by Colorado in 1928 was acted on. The Special Master reached some conclusions and attempted to apportion the remaining river flow. However, the Court rejected the Master's conclusions and basically said that the states were encouraged to resolve their differences through negotiation and compact. John Martin Reservoir was practically completed and started filling in about 1943, and in 1945 Congress authorized the states to negotiate a compact. Compact Commissioners were appointed by the governors of each state. The Compact Commission consisted of representatives from the basins of both states and also the federal government. They worked to develop the compact, which took 17 meetings before they finally reached an agreement in 1948. It was ratified in 1949. John Martin Reservoir was completed and fully operational the same year. The new reservoir gave an opportunity to help resolve problems because the states were able to catch the floods and the heavy snowpack flows which were unusable -- at the time they ran out of the state. The dam helped add to the efficiency of water use in both Colorado and the Arkansas Basin.

I would like to set the stage so you can have a perception of the time frame and what was going on at the time of the negotiations. It was 1948, and there had been a history of about 50 years of litigation. During that time Colorado and Kansas both had been looking for solutions. They also had participated in several law suits. They had a central goal of protecting the existing users at that particular time. It was also an opportunity to look for a way to utilize the higher flows and other flows that had not been utilized but would soon be available with the completion of John Martin Reservoir. So, they entered into a compact. The primary purpose, which is stated in Article I, was to settle existing disputes and to prevent causes for future controversy between the states of Colorado and Kansas. This was to equitably divide and apportion between the states of Colorado and Kansas the waters of the Arkansas River and the benefits arising from the construction of John Martin Reservoir. Article II states that the Compact was based first on the physical conditions peculiar to the Arkansas River and its natural drainage, second, on the opinion of the United States Supreme

Court that was handed down in 1943, and third, on the experience derived under the various interim agreements between the states for temporary operational procedures for John Martin Reservoir. Using that experience as set forth in Article II, the Compact is based on the physical supply of the river system, what the Supreme Court has told us, and the new ability to use John Martin Reservoir. Article III sets out some definitions: it defines what the new "stateline" is; it defines what the "waters of the Arkansas River" are; and one of the key points to Article III is that the "waters of the Arkansas River" are the waters originating in the natural drainage basin of the Arkansas River, including its tributaries upstream from the stateline and excluding water brought into the Arkansas River Basin from other river basins, in effect, setting aside waters that are imported through trans-mountain diversion. Article III also talked about the John Martin Reservoir Project and defined types of storage that would occur in John Martin Reservoir. First they defined what flood control storage was, and it is that portion of the total storage space allocated to flood control purposes. John Martin Reservoir operates not only as a source of supply for irrigation water, but also as a flood control project. In 1921 we had major floods in the basin, and any of those who are familiar with the Purgatoire River know how real flash floods can come down that system, as well as Fountain Creek and the rest of the rivers and streams in the Arkansas River Basin. They defined the conservation pool as that portion of total storage space in place at John Martin Reservoir lying below the flood control storage level. They recognized the ditches that were in the former Water District 67, as we call it, which are the ditches that lay below John Martin Reservoir and receive a direct supply from the reservoir. They defined the river flows into the reservoir, and they also defined the compact Administration.

Article IV is one of the key articles of the Compact. It deals with the waters of the Arkansas River, and is only concerned with the rights of the two states and excepts the waters of New Mexico that might be physically tributary to the basins. This protects the small users of water in New Mexico along Raton and Trinchera Creeks. Further, it recognized John Martin Reservoir as being operated by the Corps of Engineers and that they would operate the reservoir exclusively during flood control periods. They set the bottom of the flood control storage area. At that time the elevation was 3,851 feet and releases from flood control storage were made at times and rates determined by the Corps of Engineers and as necessary or advisable without regard to ditch diversions or capacities or requirements of either state. In other words, during flood control situations the Army Corps of Engineers operates the reservoir.

Article V states that the conservation pool, which is a pool that is set aside for irrigators, is for the benefit of water users in Colorado and Kansas both upstream and downstream from John Martin Dam. Article IV-D which is a key part of the current controversy litigation is important: it states that the compact is not intended to impede or prevent future beneficial development of the Arkansas River Basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoirs and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works provided that the waters of the Arkansas River as defined in Article III shall not be materially depleted for use by the water users in Colorado and Kansas under this Compact by such future development or construction.

Article V sets out the operation of John Martin Reservoir at the time of the signing of the compact. Remember things changed once you built John Martin Reservoir. You had a situation where you had a free flowing stream, and basically diversion dams and irrigation. Once John Martin Reservoir was completed and the Compact was signed things changed, because we had this large bucket of water that we could use for serving both states. They defined winter storage as the entire amount of water that came into the reservoir between November 1 of each year and ending March 31st of the following year, except that Colorado was allowed to bypass 100 second feet of water through for uses below John Martin. They defined summer storage as that storage that occurred from April 1 of each year through October 31 of each year, and that is basically the capturing of the flood flows.

They also specified maximum release rates for water to flow out of the reservoir when required by users in either state. Release of the water stored pursuant to provisions regarding storage shall be made upon demands by Colorado and Kansas concurrently or separately. Sub Section C basically states that once you've captured the water and stored it, either or both states could call for that water as needed. They divided the maximum release of water 60-40, 60% of the water for Colorado, 40% for Kansas. The result, as brought out in recent testimony, was that while it was thought the reservoir would be operated so that users would call water and use it as needed and thereby conserve water, once one person started pulling water in one state everybody started pulling water, until the pool was empty. There were several

years where everyone was pulling water as quickly as possible because there were no provisions in effect. Due to this common pool concept they ran it until it was gone. That rush to evacuate the reservoir will be changed, as I will discuss later, when I describe how the present 1980 Operating Plan works.

Article V set out rates of delivery at different times depending on the amounts of water. If there was more than 20,000 acre feet in storage they could release at a rate of 1,250 second feet; if there was less, releases were cut back to 1,000 second feet. This article also prevented any call from coming upstream through the reservoir against ditches with junior water rights if there was water in the conservation pool. There were no credits or debits, as I previously mentioned. In the event that the reservoir was going to be drained, the Compact Administration must notify the State Engineer 14 days prior to the anticipated date of the reservoir being drained. Once the reservoir was drained the call was then passed through upstream. When the conservation pool was empty, Colorado operated on its priority system and Kansas was allowed to use any waters that may cross the stateline but was not entitled to demand any water.

One of the other important aspects is that they didn't allow the transferring of water rights out of Water District 67 if it was going to place a burden on other users by changing the consumption. Article VI of the Compact basically sets up the jurisdiction. It states nothing in this Compact should be construed as impairing jurisdiction of Kansas over the water users of the Arkansas River that originate in Kansas, and nothing in the Compact should be construed as supplanting the administration by Colorado of the rights of appropriators of water in the Arkansas River in the state as decreed by the Colorado courts. They made provisions for the Frontier Canal which starts in Colorado and actually serves Kansas, which is to be counted as part of the stateline flow. They set forth that each state, and every water user claiming a right to use water through the state, was subject to the Compact.

In Article VII a Compact Administration was set up whereby each state appoints three representatives. In Colorado there is one representative from Colorado's Upper Basin (Districts 14 and 17, which are above the John Martin Reservoir), one representative from Water District 67 (below John Martin Reservoir), and the Director of the Water Conservation Board who serves as the State of Colorado's representative. Kansas has a similar situation with their appointees. Each state gets one vote. There is a federal representative that sits on the Compact Administration, currently Larry Trujillo. He chairs the Administration but has no vote. Decisions have to be made by unanimous consent of the two states.

Perhaps this has become kind of dry, but let me go back over it and I'll try to paraphrase it a little bit. We had the compact signed in 1949 that set up criteria for John Martin Reservoir. The conservation pool in John Martin Reservoir apportioned release of those waters 40 - 60. You could call the water out individually either by state or together. Everybody was taking their water out at the same time, only limited by Compact-specified rates on how fast you could deliver the water out of the reservoir. Once the water was out of the conservation pool then we went back to the normal priority administration of the Arkansas River in Colorado with Kansas obtaining the return flows that were at the stateline.

In 1980 the Compact Administration, with the efforts of many others (because of drainage of the reservoir), developed a refinement to Article V-D which would allow an operating plan where they could save water until it was really needed. They could call for release of water as needed, and carry water over and utilize it a little more efficiently. Basically, the operating plan sets up an accounting system for the water that goes into John Martin Reservoir. It allows the ditches below John Martin Reservoir to have a pro-rata share of storage volumes and now also allows some of the ditches above John Martin Reservoir to store some winter water in accounts. It provides for a transit loss account with water reserved to carry deliveries to the stateline and into Kansas. Since 1980 it has improved the operations of the reservoir quite a bit. Both states agree with this and there is a continuing resolution of the Compact Administration to operate under the 1980 plan. A lot of hard work from people in the Arkansas Basin went into it. They looked for ways to become more efficient and tried to utilize the resources that we had available.

In summary there has been almost a hundred years of litigation over the Arkansas River. Each era had its own type of debate and what caused controversy and litigation varied depending on the facts of the time. This is a period in which we should be moving toward mutual cooperation on the Compact, trying to look for solutions. Hopefully we can move forward toward the reduction of conflict and a better understanding on the river, to new opportunities for solutions to old

problems. It's not going to be easy for Colorado. We have issues before us that are going to be costly. It will require changes in operations and farming practices and we will need to look for opportunities for innovative solutions. We at the Conservation Board have worked hard over the last year, along with the State Engineer's Office and water users through the Arkansas River Coordinating Committee, to look for solutions. We're also proposing legislation to give some assistance to the basin. With that, I will close and take time for some questions.

Q. Inaudible (Question about changes in farming practices)

A. What I am suggesting is that because pumping ground water is quite expensive, it will be expensive to purchase augmentation water and also pay the electric bill for pumping groundwater. You're going to have to look at crop types that will be served by groundwater. You're going to have to look at how your pumps operate, and in some cases yes, you're probably going to want to pump less water to avoid over-application -- in other words, just pumping it out and cycling it around to prevent waste. At the same time, we're also going to have to stay within our apportionment, our historic use of the water system.

Q. Inaudible (Question regarding groundwater not tributary to the Arkansas River.)

A. You're changing subjects on me. Basically, the Ogallala Aquifer is also utilized in Kansas, but the Ogallala Aquifer and the use of designated groundwater, as we call it, is controlled by the Colorado Ground Water Commission. It is handled under a procedure developed in the 1950s and '60s to try to do something about the problem. The Arkansas River groundwater pumping is principally from the tributary alluvium which is on both sides of the river and terrace gravel on the mesas. Here's how the river actually operates: basically, the large irrigation canals take water out of the river and recharge the groundwater tables; then they pump the conjunctively used groundwater if there wasn't surface water available. Under the recent Supreme Court decision Colorado will have to cut back on utilizing those irrigation wells in order to meet the obligations to Kansas. We have to be able to, in effect, deal with the depletion caused by the wells' pumping, This is tributary groundwater, a renewable resource, and it comes back every year. As the river flows and as we irrigate, we recharge the groundwater. Many people start thinking in terms of conservation -- that is, if you would apply it more efficiently, there will be more water. You have to think of what actually happens to every drop of water that you use. When you divert water from a stream, and with flood irrigating in particular, there is some leakage off the bottom of the canal which recharges the groundwater table. You spread it on a field and a percentage of that water is consumed by the crop, through evapotranspiration. Particularly in the Arkansas Basin, a large amount of that water is returned to the basin through groundwater recharge. Groundwater recharge seeps back to the river later in time. The time it takes to come back depends on how far you are away from the river. As it soaks into the gravel it changes the time it gets back to the river; there is a delayed effect when you intersect the groundwater system and change this timing with pumps. Say you pump 4 acre-feet per acre -- if you are flood irrigating maybe your crops are only consuming 2 acre-feet for every acre you irrigate. The rest is returned because the plants don't use it all. If you change practices, you have to be very careful not to enlarge upon consumption of the water. In other words, if you can pump more efficiently and pump less water you still can grow the same crop, but with reduced energy costs. You haven't necessarily saved water.

Q. Inaudible

A. That's what I was trying to talk about earlier. If you look at the Arkansas River Basin you have a valley that is 5-10 miles wide, primarily carved out of shale, that has been filled over time through deposition with gravel and sand. Those are the valley fill aquifers. Additionally there were some glacier deposits up on the mesas as a result of glaciation and those are still tributaries. Lets think about the Bessemer Ditch, for example. It takes water out high up above Pueblo and it takes it out onto the St. Charles Mesa. That mesa has a large gravel layer, it irrigates that mesa, and recharges that aquifer. With the tributaries of the Arkansas where the streams have eroded the mesa you see springs cropping out, and there are return flows out of that aquifer back to the river. They are physically connected through recharge and return flows.

Q. Inaudible (Question about useable flows)

A. I'm going to talk a broad concept here. Usable flows to me would be water that is available in quantity to be useful for irrigation purposes in Kansas. In other words, if a flash flood is coming through and the ditches could not pick it up it may not be usable to Kansas. If it comes at a time of year that it's not needed for irrigation, it may not be useable to Kansas, so there is a bit of flexibility with this issue. It is difficult to define, since they didn't clearly define what it was. The Special Master has ruled, and I believe that David Robbins will expand on it later. Further review in the litigation may well be needed to determine the level. We have stipulated presently to past depletions that have occurred, and I believe it is approximately 325,000 acre-feet over a 31-35 year period. This comes from my reading of the case and what they said in the case. At the time when they were negotiating the Compact there was a reservoir up above Colorado Springs that had some leakage in it, it was about 6 second feet, and they were worried about how could they fix the leak and still use the water. At that time the Compact Commissioners said, "Look, we are not going to argue about what they said was a teaspoonful of water in comparison to the entire river." In other words, it wasn't a major change so they tried to say, "Let's don't get down to that small detail." Significant changes would be a matter of degree that would later arise as we go through it, so we have to be careful. This case is showing us that we have to look at some lessons we've learned as a result of this case -- if you start changing uses and changing technology you may significantly change what the historic regime of the river system has been. One of the things we have found as a result of this case is that there are not a lot of good records. There were not a lot of records kept in the 40's, there haven't been a lot of good well pumping data, and while there have been records on surface diversions, the pumping data is not there. So, it's difficult to account for what goes on in the river system, and as a result of what has occurred on the Arkansas River and knowing we have a similar compact on the Colorado River, the state has gone forward with a little more aggressive methodology. We're doing what we call the Colorado River Decision Support System -- developing computer information -- developing better technology and data of what our historic use has been. We have to quantify those things as we go to protect ourselves in the future. It is really important for Colorado to have good data and traditionally we have not collected good data on many of our historic uses.

Q. Inaudible (Arkansas question)

A. For the Colorado River, yes it is, and we've done a lot of work since the case. We have developed similar information on the Arkansas. As a result of the case, groundwater pumping data is part of the rules and regulations of the State Engineer's Office. We now require reporting of that data so we can get a better handle on that information. Yes, we're striving to get that data now for the Arkansas in more detail, and rather than waiting and going down the road 20 more years on the Colorado River we're trying to get ahead of the power curve. As it would appear, we have not used all our apportionment on the Colorado River side and we've now developed data to support that.

Q. Inaudible (Question concerning pumping of wells in the future.)

A I think with augmentation we can continue to use our wells. We should be able to use our wells. It's a real juggling act in the basin. On the one hand, we're going to have to replace our depletion to Kansas from well pumping, and on the other hand we have the farm economy of the basin that is quite important. One of the things we tried to do with the coordinating committee was to look for solutions to that very problem. One of the recommendations that came out of the committee was to look at communities such as Colorado Springs , Pueblo and others that have developed water resources with both in-basin and trans-mountain imports. They've used a planning approach for future years so that they could have a supply as their communities grow. That's a good public policy in terms of the cities. So, at the present time there is some water available, in my opinion, that can be utilized, that in the future will be used by the cities. The issue, in my opinion, is going to be how we allow the well users to utilize some of the water that we can find today to augment and then look for long-term solutions, so that when the cities need that water for their purposes and take their water back, how it can be replaced. I think that is one of the big problems we're faced with so that we can continue to use the wells. I do see a decrease in pumping; I see a cost to people that's going to impact that. We're going to have to augment, and the wells that don't augment are going to be shut off. We have no choice in that matter. I see changes in the future of the wells. If we have time, perhaps we can look for solutions. We have to get cracking on the issues.

One of the things we're working with through the state legislature is that our agency has some funds that we can loan. We're proposing a loan to the Lower Arkansas Water Management Association which is a well user group below John Martin Reservoir, a low-interest loan to help them purchase existing water rights, dry up some acres, and divert that consumptive use for water augmentation. There's a solution there. We have also reserved funds last year through the legislature for startup loans for other augmentation groups that would like to come to us. We could look for ways to work with you to do that.

Some of the things we are proposing in the legislature this year go beyond loans. We're also proposing to give some grants in terms of small dollars, up to 50,000 dollars for well user augmentation groups to build computer systems and link them with the State Engineer's Office so we can have an integration of the system of data collection so that we're not all reinventing the wheel and to get a better handle on pumping and depletion. We're looking for ways to assist and aid, but at the same time we fully realize that we have to reduce the well pumping in order to meet our obligations.

The Influence of the Court

The Honorable Judge John R. Tracey

It's always enjoyable for me to be with water people like yourselves. I was asked to talk a little bit this afternoon about some of the ways in which the courts have influenced the direction of water law in Colorado. Our courts have helped to shape or mold water practice and water law. I have to start out with a shaggy dog story. I apologize, but I happen to like shaggy dog stories, and it makes a couple of points that I would like to make. It is a story attributed to a friend of mine, Judge Benton, who until his retirement recently was judge of the Denver Probate Court. Judge Benton was handling an estate. The decedent was originally from the Middle East. Among his assets when he died, the man had 17 camels. The provisions of his will were that one-half of his assets would be left to his oldest daughter who was his favorite, 1/3 of his assets to his middle daughter, and 1/9th of his assets to his youngest daughter. Try as he might, Judge Benton could not figure out how to divide 17 camels in half, let alone into a third or a ninth. So he threw up his hands and said, "O.K., I'm going to sell these camels and divide up the proceeds. I know how to split up money." But the daughters said no. I guess camels are special in a kind of camel way and they did not want these camels sold. So Judge Benton said, I will appoint a Special Master. I think you've heard about Special Masters. So he appointed a fellow from somewhere up around Salida, who accepted the appointment and set the matter for a hearing. On the day set for the hearing , he showed up with his own camel. He said, "This is no problem. I'll add my camel to your 17 camels and that makes 18. I can divide 18 in half, the oldest daughter gets half or 9, the middle daughter gets a third or 6, that totals 15, and the youngest daughter gets a 9th that's 17, then I'll take my camel and go home. Which he did. And everybody was very happy. My point is that sometimes it really helps if you bring a little something extra to the table.

I would like to think that maybe on occasion our courts have been able to be innovative and have made everybody happy. I want to make a defense of how the courts have operated in this state, and I'll tell you that right up front. I think the courts have provided a mechanism, a forum , a way to balance a good many interests throughout the community: urban vs. rural, agricultural vs. other interests, east vs. west and so forth.

The Colorado law of water rights is largely the product of the free market system and the English common law. Very simply put, in the mid-1800s farmers, ranchers, and miners established rights simply by diverting water and placing it to use. This was the method that was used that created a system for the allocation of a very scarce resource. This preceded Colorado statehood by many years. This appropriation doctrine was later incorporated into our Constitution and it's the root of Colorado water law. Virtually all of the most senior water rights in the state were established by this kind of spontaneous process which was then confirmed by the Legislature and later court decisions.

The very first recorded case involving a water matter that I have been able to find was the case of Yumker vs. Nichols. It was decided in 1872 by the Territorial Court. One of the judges in his opinion observed, "In a dry and thirsty land it is necessary to divert the waters of streams from their natural channels, in order to obtain the fruits of the soil, and this necessity is so universal and imperious that it claims the recognition of the law." In the Yumker case, a very typical kind of case in the early 1870's, it was the problem of two men building a ditch, one upstream, one downstream. The man upstream diverted and cut off the man downstream, and I suppose that may be the earliest recorded example of the old adage that it is better to be upstream with a shovel than downstream with a senior water right. That was almost 125 years ago and we are still dealing with it. But what was important in that case was that the Colorado courts very early recognized that there is a great difference between Colorado and conditions in the more humid and moist east. What worked back there wasn't going to work in Colorado. Back east the riparian doctrine was essentially what established the right to use water. The riparian doctrine simply said that if you owned land alongside a body of water, a stream for example, you were entitled to take a reasonable amount of water for your use. There were two problems: one, you had to be alongside the stream or alongside a body of water and that wasn't going to work out here. The second problem was that there was no certainty of right. A specific rate of flow and volume was not established. It was a rather nebulous kind of "reasonable amount" of water and that wouldn't work here. It's bad enough trying to raise a crop under the climatic conditions that sometimes go on around here without having to worry about the uncertainty of water rights, so the courts in Colorado said no to the riparian doctrine and confirmed the appropriation doctrine which permitted a more extensive use of water and gave certainty to the appropriators. The court in the Yumker case reasoned

that these rights existed even before any statute was enacted and would survive even though the statute were repealed. The court felt that strongly about this doctrine and how it provided the basis for our water rights and our system of allocation and distribution of water in the state.

The second recorded case in Colorado involving water came two years after Colorado was admitted to the Union: Schilling vs. Rominger. This case also confirmed the doctrine of appropriation. Again the situation was the same; an upstream diverter cut off a downstream diverter. The downstream diverter had 15 acres of oats which he lost. His damages were $187.50 so he immediately appealed, something that has happened in Colorado with some frequency since.

The early period of the involvement of the courts in water in Colorado could be referred to as the appropriation era, and their primary task at that time was to adjudicate the numerous stream systems and decree the quantity and priority of competing appropriators. However, there was at least one case dealing with water quality in the early years, in 1912, long before there was any legislation in that area, long before there was a great concern about pollution. In 1912 the City of Pueblo and the City of Canon City filed a suit to enjoin a placer mining operation up near Twin Lakes. You may remember this came out in the O'Neill case, and some of you may know the progeny. I think there are four O'Neill cases that were appealed to the Supreme court. Finally, O'Neill went to the U.S. District Court. The problem was that the placer mining operation was using vast amounts of water and had excellent water rights. They were using this water to wash down tons and tons of sand and gravel and gold-containing ground. I don't know anything about gold mining, but they were washing the gravel and the gold-bearing matter down through sluices to try and collect the gold. All of this ended up eventually in the Arkansas river and there was a glacial flour of very fine material that wouldn't settle out so that Canon City and Pueblo could not make the water suitable for municipal use. They soon got an injunction against the operation, and without all that material going into the river, the problem cleared up. No more glacial flour, no more problem with that kind of pollution and Canon City and Pueblo had good water again. Incidentally, by 1912 all the gold was almost gone anyway so it wasn't a great loss as far as the mining company was concerned. They walked away from the area and quit any efforts to mine up there. But that is at least one example where the courts were able to respond to a quality issue, not just quantity and priority.

In the time just after World War II, with the availability of cheap electricity and improved pump technology, groundwater came into its own. In some states two doctrines were adopted: one with respect to groundwater and one with respect to surface water. Colorado was smart enough, and the courts were smart enough, to determine that where the two are hydraulically connected there should be one doctrine to apply. That is the appropriations doctrine.

Many of you are familiar with the Felhauer case back in the 1960s. It was decided by the Supreme Court in 1969. The Division Engineer had shut down about 39 wells out of about 1600, and the Supreme Court said, "No, you have to have rules and regs first. You cannot operate in that fashion." Regulations did, of course, follow. Again that procedure in the courts provided an opportunity for hearing and brought a lot community input and court approval.

There was also a series of cases in the 1970s that groundwater is tributary to a stream and thus is subject to stream priorities, -- District 10 Water Users Association cases, and so forth. One of the things that the court said was that groundwater is not subject to senior stream priorities when the time lag exceeds one hundred years. You will find that now in the statutes, because the court said the connection would be de minimus if the time lag exceeded that amount of time. That was written into the statutes and refined to 1/10 of one percent, but the courts had the opportunity to first address the issue. You can see that there has been a process that after hearing the evidence, many engineers for example, and the best legal arguments that can be presented, the courts have been called upon, where there has not been any guidance, to address a new situation, to make policy, and I think this is appropriate. I think it is necessary for the courts to do that. It is reviewable by the Legislature. The courts also applied the rule of material injury to groundwater. That was also later codified in the statute. The court took the lead in trying to find ways to reduce harm to accommodate competing interests.

This kind of spontaneous system of developing law through litigation, which is essentially how the common law developed in England, has not been without its detractors. I found something kind of interesting that was attributed to a

man by the name of William Hammond Hall, California's first state engineer back in 1901. He said, referring to this system of developing law through litigation, "The system is wrong; it is wrong in principle as well as faulty in procedure. Leaving the ownership of streams to be fought over in the courts, and titles to water to be established in ordinary suits at law has never resulted in the creation of satisfactory conditions and never will. Each decision, instead of being a step toward final settlement, too often creates new issues which in turn have to be litigated." I would interject at this point that I think what California had at that point was a system in the courts that was very flexible and could meet new situations. Nevertheless, Mr. Hall was critical of the system. He went on to say, "Irrigators cannot live in peace. Litigation and controversy are forced upon them. There never was a time when doubtful or controverted policies should have been evaded by the lawmakers and thrust upon the courts for settlement. There is as great a need for specially qualified officers to determine the amount of water supplied and regulate its distribution as there is to survey the public land. There is as great, if not greater, need of a bureau to supervise the establishment of titles to water as there is for land officers to manage the disposal of public land." The California legislature did not listen to Hall and adopted the appropriation doctrine, which is common all over the West and proved to be a workable system. As you are all aware, in the early 1900s there was tremendous agricultural development in California despite what Hall referred to as the messy lawsuits.

One of the criticisms of our court-centered system has been that the "public interest" is not adequately represented in water issues. My response to that would be that all you have to do is look at a couple of the major cases of the last 20 years. The federal reserved water rights cases back in the '80s for example, or the AWDI case, to see just how many and how varied the interests were that were represented. I'm talking across-the-board water interests in the community. There is that opportunity through this process for a very wide representation and presentation of points of view.

Another thing that the courts have been able to address, I think somewhat spontaneously, has been the revegetation issue down on the Rocky Ford Ditch and on the Colorado Canal. Maybe it hasn't been 100% successful, but I think it has been significantly successful. This is an instance where the court was able to fashion some kind of a response to the community call for addressing environmental concerns as well as other agricultural interests to keep down dust and noxious weeds and so forth. It did provide that opportunity, and the courts were able to respond. And of course, the most persistent criticism of the Colorado water law system is that it is too costly, too time-consuming, inefficient, too many lawyers, too many engineers, and there is no doubt that Colorado is notorious around the country. Why are so many people willing to pay the price? I think it is simple enough -- that water is valuable. It is without any question the most valuable resource in this state and this litigation system reflects that value of water. The decisions that result are the outcome of very well supported evidence that has been presented, opportunities for many divergent interests to be presented and the best legal reasoning that can be presented or generated. There is an old saying that the wheels of justice grind slowly, but very finely. I think that has happened in the water area. I think the grinding has been frustrating, it has taken a long time and there has been a lot of criticism of it, it has been expensive, but it has ground pretty doggoned finely. I think we have a good system, and I would encourage you not to support any kind of dramatic change of the system without looking at it very carefully. I think the courts have been effective, I think the courts have been responsive. I think competing interests have been balanced, and there has been a reasonable degree of certainty and stability provided in the process, yet, there has been flexibility.

I would say that there are several guiding principles that have grown up in the courts or that had been confirmed by the court in our process that have to remain part of our water law system. One, the appropriation doctrine. No question about that. Another one would be the doctrine of maximum utilization. Another would be the protection against injury. Another would be certainty of rights yet with a degree of flexibility to meet changing conditions. I think that our courts have provided those foundations, have followed and have very strong biases in favor of those principles which should be maintained. I disagree strenuously with the contention that our water laws and institutions have been out-paced by the complexity of the issues they were designed to address. I disagree and I say I hope you will always encourage sticking to what we have, which is a pretty fine system for water law development. It works.

What Did The Court Say?

David Robbins
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(Since 1985 David Robbins has represented the State of Colorado in the U.S. Supreme Court Case of Kansas v. Colorado. This involved the alleged violations of the Arkansas River Compact.)

My talk should probably be called "What Did the Court Say and What Didn't the Court Say?" My partner, Dennis Montgomery, has worked diligently on this case for the last ten years as well. Dennis was instrumental in advocating Colorado's position.

When a state sues a state, the Constitutional framers determined that that litigation would occur in the United States Supreme Court. If you think about history, you will recall that there were 13 colonies, each of which viewed itself as being sovereign and independent. They came together to form the United States. Each of those states was jealous of its prerogatives. The framers of the Constitution decided to allow the adjudication of differences of opinion among these sovereigns by the highest court of the land, and the only constitutional court of the land, the U.S. Supreme Court.

In the early days, when a state sued a state, the court actually listened to the arguments and the evidence and handed down a decision. Over the years, the increasing number of states gave rise to an increasing number of disputes, and with the increase in the number of citizens and the complexity of the laws, the court's docket became more and more crowded . Over the past 30 or 40 years a system of appointing a "Special Master" was adopted. The court appoints an individual, who can be a judge or a noted lawyer in the American legal community, to sit and hear the positions of the contesting states and to render to the Supreme Court his recommendation concerning the facts that he has heard and any legal decisions he believes ought to be entered.

The Special Master is not a judge. He is an officer of the U.S. Supreme Court. To those of you who think that Kansas v. Colorado has been in some kind of federal court appellate process, it has not. The case, since 1985 when it was filed, has been under the jurisdiction of the U.S. Supreme Court, and Arthur Littleworth from Riverside, California, a noted California legal scholar in water and natural resources law, has been the Master. He presents his recommendations to the court, and the court then considers those recommendations and hears arguments of the parties. The court is then free to do whatever it likes with those recommendations. The court can throw them out, send them back, tell the Master to start over, appoint a new Master, change whatever findings it wants to change, change whatever rulings of law it wants to change, or, as in this case , it can simply say, "We think you did a good job. We adopt them."

The Constitution did another thing -- it provided that disputes among these sovereigns, who made up the United States, could also be resolved by agreement. This was provided for in the compact clause of the Constitution. It permits states, with the approval of the U.S. Congress, to enter into compacts on issues of common interest and jurisdiction. These are areas where two or more states may assert sovereignty over a particular subject matter and sit down and work out their differences and agree on what the allocation will be. It is a constitutional mechanism that allows states to come to an agreement so they are not constantly litigating. The Arkansas River is a classic example. The States of Kansas and Colorado both have water users who depend upon the waters of the Arkansas River both for economic well-being and for protection of environmental interests in the two states. When water demand and consumption occurs in one state, it affects the other state. A compact was entered into to try and resolve those issues.

I want to emphasize the purpose of a compact in the case of water. It allocates the right to use certain portions of water to two or more states. The fact that compacted water arises in Colorado is irrelevant. Colorado's Legislature, Kansas's Legislature, and the U.S. Congress have ratified a document that says what Kansas is entitled to receive. It is a law of the State of Colorado, entitled to enforcement just like any other law. It is a law of the U.S., entitled to enforcement just like any other national law. Whether you like it or don't like it, think it is fair or unfair, it is the law of the land at this time.

The Master heard claims from the State of Kansas that Colorado had violated the compact between the two states covering the waters of the Arkansas River in three particulars:

- Kansas alleged that the operation of the Trinidad Reservoir and the way in which water was stored in that reservoir was in violation of certain operating agreements entered into between Kansas, the Purgatoire River Water Conservancy District, and the Bureau of Reclamation.

- Kansas also alleged that the operation of winter water storage in Pueblo Reservoir, a feature of the Fryingpan-Arkansas Project, violated the compact by increasing the amount of depletion that occurred to the waters of the Arkansas River.

- Kansas alleged that post-compact wells, numbering some 2,000, had the effect of increasing the amount of depletion to the Arkansas River.

After the Master had heard the preliminary skirmishing, he decided to bifurcate the trial. We now have had the first phase of that bifurcated trial, and that was to determine liability, the question of whether or not Colorado had in any particular way violated the terms of the Arkansas River Compact. The second phase of the trial will be the remedy phase. That is proceeding at the present time. The purpose of the remedy phase is twofold:

First, to determine the amount of depletions that occurred in violation of the compact. How much water should have gone to Kansas from 1950 to 1994 that did not go to Kansas?

Second, to determine how Colorado will comply with the compact in the future. How will Colorado ensure that the state line flows to which Kansas is entitled (referred to as usable state line flows) are not diminished in the future?

In addition, the Master has to decide, for the quantity of depletions that occurred over the last 45 years or so, what Colorado will do to repay Kansas or make Kansas whole for the lack of supply.

I want to emphasize this again -- the fact that there is water in the Arkansas River, in the river system in Colorado, does not give the State of Colorado the right to consume it all. Colorado may only divert and consume its equitable share of the waters of the Arkansas River.

The Arkansas River Compact, then, signed in 1948, basically was a stand-still compact. The concept behind it was that the waters of the system were being fully used under many circumstances in both states. In fact, there was insufficient water in the system under many conditions to serve the existing water users in 1948 in both states. The idea behind the compact was that neither state would increase the amount of depletions to the river unless it could show that the increase in use did not derive water users in the other state of supplies to which they were entitled.

Basically, the concept was to draw a line in 1948 -- anything that happens in either state after '48 that has the effect of depriving users in the other state potentially, potentially, could constitute a violation of the compact. I want to make it clear that in 1948 and today there is unused water in the system under some circumstances, and the compact recognizes a state's right to make use of that unused water, if it can, without injury. That is an important concept.

Unstability, as far as the Arkansas River Compact is concerned, is looking at water use in the mirror of 1948. Usable flows means those waters which would have been used in 1948 by the structures and conditions that existed then. In the State of Kansas, a certain number of ditches, under certain flow conditions, received water. There was a certain increment of water that went to recharge for pre-1948 wells in Kansas, and there was also water that flowed across the state line, through western Kansas, and right out the other end of the compacted reach at Garden City. The compact framers thought of the water that passed Garden City without anyone diverting it as being unusable. They contemplated that both states, Kansas and Colorado, could undertake steps to try and capture that water. One of the measures to do so was John Martin Reservoir, which would capture and regulate flood flows for the benefit of users in Colorado and Kansas.

The Master, after months of trial held in Pasadena, California, found, and the court confirmed, that of the three Kansas claims the Trinidad claim and the water storage claim for Pueblo Reservoir were unfounded and not proved and dismissed them both. In the third claim, that post-compact well pumping in Colorado deprived Kansas of water, the Master found that Kansas had proved depletions in violation of the compact, although he didn't quantify how much depletion had occurred.

Importantly, he also found that the State of Colorado and its water officials had been in good faith and had not set about trying to damage Kansas or to take water away from Kansas. They had intended to permit the use of unusable flows in the Arkansas River under the compact, and they did not believe that wells were creating a cognizable harm to the State of Kansas. That is important. That is why the Master will give Colorado a chance to come up with a solution in the future. That is why Colorado will have a say in how to redress that injury. The Master found that the injury existed, but it wasn't one that Colorado or Kansas understood or knew about until shortly before the litigation was filed.

Judge Tracey did a wonderful job of talking about the evolution of Colorado water law and some of the important issues that have arisen. Remember, Colorado is a prior appropriation state. The Constitution authorizes water users to use water in accordance with their priorities. When there is insufficient water, more junior water rights have to be shut down, so seniors are entitled to use their supply. Water in Colorado is presumed to be tributary to streams and subject to the appropriation doctrine unless shown in a specific instance to be non-tributary and therefore not covered by the doctrine. As a result, wells in tributary formations, just like ditches, are subject to the constitutional doctrine of prior appropriation. That doctrine operates not against all water in the state - it operates against the water to which Colorado is entitled under an interstate compact. So, there is a limitation on how much water Colorado water users can divert within the priority system.

Colorado finds itself with approximately 2,000 wells that are junior to our obligations to the State of Kansas. They also are very, very junior to many senior surface water rights and ditches that have existed in the Arkansas basin from the late 1860s and early 1870s. Under any decision of a Colorado court or the current decision of the United States Supreme Court those more junior wells should not be able to operate unless they replace any injury or depletion that they cause to water of the river which otherwise would be available to Colorado senior surface water rights under the Colorado Constitution or to the State of Kansas under the Arkansas River Compact.

After the court decided that Colorado had in fact, although unknowingly, been in violation of the Arkansas River Compact, Kansas immediately sought to obtain an injunction requesting that wells in the Arkansas basin be immediately shut off and not be allowed to pump until such time as Colorado and the well owners had convinced the Supreme Court and the Master that Kansas would receive all of the water supply to which it was entitled. The Master, for what I think was good reason, said he would not grant that injunction. He said Colorado was found in violation but should be given a chance to propose a solution.

Hal Simpson, the State Engineer, is responsible for the future solution, and I am not going to steal his thunder. I do want to say a couple of things, though. Both Colorado and Kansas, through their evidence, showed that the wells in the Arkansas basin were causing stream depletions which to some degree were depleting usable state line flows to which Kansas was entitled under the compact. The State of Kansas is entitled to the protection of the compact and the law of the State of Colorado, which embodies and encompasses the Arkansas River Compact. Colorado does not have a choice. It must enforce those laws so long as they remain on the books, and so we have to propose a solution to the problem.

A well permit is very similar to a driving license. It entitles you to drill a well. In that well is water. That water is subject to the constitutional doctrine of prior appropriation. You aren't entitled, simply because you have a well permit, to pump that water unless you are doing it in the priority system or in a way that does not impair senior water rights under the Colorado Constitution. You all have driver's licenses which the state gave you, but that doesn't mean you can speed. There is another law that says "no speeding," and if you speed or drive drunk you can lose your license. You can drill a well, but that doesn't give you an ironclad right to pump that well and take water that belongs to someone else in this state or the State of Kansas. That is the legal framework with which we are dealing here.

For those of you who think that merely by regulating the use of water and wells there is somehow a government taking involved, let me tell you I think you are in error. The Colorado Constitution does not give you a right to a certain quantity of water. It is a usufructuary right. First, the water belongs to the people of the state subject to your right to make a use of a portion in priority. If you have a well that is junior, you are not in priority if the result of pumping that well injures other more senior water users or users in the State of Kansas under the compact.

Colorado, although unknowingly, allowed the compact to be violated, and Colorado has to solve the problem. We have a legal obligation to deal with what has happened between 1950 and the present. In late October Kansas and Colorado stipulated that the amount of usable state line flow that had been depleted to the State of Kansas by users in Colorado was about 328,000 acre-feet for the period 1950 to 1985. We are negotiating with Kansas today to try to resolve the 1986 to 1994 values. Colorado, at some point, will have to repay Kansas for those depletions, in water or money. In January, Kansas will file a brief. Kansas will tell us what it thinks Colorado ought to do as a legal matter to redress that compact violation. Colorado will respond in May, and Kansas will reply in July. The Master will then hear arguments and decide.

Those hearings will go on over the next several months to a year. If we fail to control post-compact well pumping, the Supreme Court and the Master will do it for us. Kansas has already asked to have a special federal river master appointed to run the river. The request has not been acted on, but if Colorado fails to come up with a program that adequately ensures the Master that Kansas will receive the water to which it is entitled under the compact, he will be forced to come up with his own remedy, and Kansas will push very hard for that remedy to be a federal official who has little interest in what goes on in Colorado and has, as a sole, driving purpose, the need to be sure that Kansas gets its water.

Finally, one other point - Colorado lives by compacts. We expect our neighbors - Texas, New Mexico, Kansas, Nebraska, Arizona, California, Nevada, Utah, Wyoming - to live by the terms of those compacts and to allow us to use as much water as we are entitled under those compacts. We have an equal obligation to comply with the compacts to which we are signatory.

The New Rules

Hal Simpson, State Engineer
Colorado Division of Water Resources

I think the reality of complying with the Arkansas River Compact is now fully upon us. One of the key provisions of the compact was that after December 14, 1948 there was to be no additional water resource development in the Arkansas basin in either state if it depleted usable state line flows. You heard David Robbins say that the Special Master, affirmed by the U.S. Supreme Court, had found that, in fact, around 1500 post-compact wells were constructed in Colorado. They were primarily irrigation wells that did violate Article 4D of the compact, so we are facing that reality. That is, as David indicated, what we are trying to deal with through rule-making.

Before I get into the new rules, I want to give you a little background on why we have to go about this type of water rights administration through rule-making. The role of the State Engineer traditionally has been to administer water rights, and that is done through the priority system that Judge Tracey described so well at lunch. However, when it comes to enforcing certain other types which are not so clear as a water right, such as a compact or bringing a well into the priority system as was required by the 1969 Water Rights Determination Act, we have to follow certain other procedures set forth by statute, and that is called rule-making, or we promulgate rules and regulations -- that is another term for rule-making.

The 1969 Act had some very specific requirements or principles that I must follow if I am to promulgate rules dealing either with interstate compacts or the administration of groundwater rights. The 1969 Act brought together the surface water priority system, which dated back into the 1860s, with wells that had never been required to be adjudicated. The 1969 act required them to be adjudicated and thrust into that priority system, wells that are a hundred years more junior. To do that, the statutes required that it be done through rule-making, and very specific steps have to be followed The rules have to be specific to a river basin; they have to be specific to certain types of aquifers; and they have to be able to optimize water use while maintaining the priority system. That is difficult, when you bring wells into the priority system. The rules must be published in every county where they will go into effect at least 60 days prior to their effective date. Since time is of the essence, the water court has to hold hearings on any protest of those rules as soon as they occur.

I want to talk about the existing rules, those that were in effect through the end of 1995, so you know we just aren't stepping forward with rules for the first time in the Arkansas River Basin. In 1973 Clarence Kuiper, the State Engineer at that time, promulgated rules to respond to the 1969 act. As Judge Tracey had indicated, there had been a false start down here in the Arkansas Basin with the Felhauser case, where there were not established procedures set forth by rules on how we were going to administer wells. The division engineer had selected 30 wells very close to the river, and shut those down. That was not acceptable to the district court nor to the Supreme Court, which directed the State Engineer to promulgate rules. In 1973, after the Felhauer case had gone to the Supreme Court and been decided, Mr Kuiper promulgated rules that basically curtailed pumping in the Arkansas River basin four days per week, allowing pumping three days. They were effective in 1973, and the rules were not protested.

At the beginning of 1974 Mr. Kuiper amended those rules and filed another set through the procedure set forth in the statute to start curtailing pumping more. In 1974 there would be five days of no pumping, in 1975 six days, and total curtailment in 1977. These rules were protested vigorously by the groundwater users. There was a trial before the water court in Pueblo. Judge Gobin, the water judge, ruled that the State Engineer had not allowed the 1973 rules to operate long enough to determine through experience and investigations whether in fact they were acceptable or suitable without tightening down on well owners more. The State Engineer appealed that decision to the Colorado Supreme Court. The Supreme Court and Judge Gobin said, "You didn't conduct the necessary investigations or allow the 1973 rules to operate long enough."

Because of that decision and the fact that there were no requests from well owners or surface water users to change the rules, they have been in effect through the end of 1995 or about 23 years. But in response to the litigation with Kansas, which filed its action in December of 1985, and the trial, which I believe began in 1990, we had a four-year period of very intense studies by both states to develop the basis for the litigation, and those investigations were important to any future rule-making because they provided evidence that could be utilized in future rules. Both states initiated very detailed and similar studies using computer models to evaluate the effect of post-compact wells and the effect of the winter water storage program. Both issues had been alleged to violate the compact by Kansas.

We both quickly learned that the data necessary to drive good computer models was lacking in the basin, so a lot of assumptions had to be made, and both models had their shortcomings. The area of focus for the modeling efforts of both states was the area from Pueblo to the state line. It basically covered the valley fill or alluvial aquifer of the Arkansas River as well as aquifers to the outside of these called bench aquifers or surficial aquifers. Basically, it is an area where there are about 2,000 irrigation wells in existence that have pumped upwards of 250,000 acre-feet (af) of water in certain years. The models were set up in a manner to evaluate both the effect of pumping and then turning off certain switches in a model to evaluate the effect of what the river would have seen in the way of additional flows had there not been pumping. Where would that water have been diverted? Would the senior surface rights have diverted more, or how much really would have reached the state line?

The study period was 1950 to 1985, and both states came down with similar results. It is not surprising, when you think about the hydraulic connection between the alluvial or surficial aquifer and the stream system. If you pump groundwater, and if you consume it in growing crops, you are going to deplete streamflow. That is a fact of physics that you really can't overcome no matter how much you would like to. Both states had similar results, although Kansas' model showed lesser depletions of usable state line flow than Colorado's model, and the Master in his report indicated that he would support using the Kansas model since it showed the lesser depletions and Kansas was the complaining party.

He further found that the 1973 rules were not effective. In other words, that reduction or curtailment of pumping to just three days of pumping per week didn't really reduce pumping, in his opinion. In fact, every year after 1973 the pumping increased or was greater than the 1973 level of pumping. In his report which he filed in July of 1994, the Master found, just to reemphasize, that most compact well pumping did deplete usable state line flows. The 1973 rules were not effective. The augmentation plans that allowed certain wells to pump seven days a week were not sufficient in offsetting depletions caused by post-compact pumping. There were some offsets but not complete offsets, so he was critical of the augmentation plans that had been approved in the intervening period. Year by year, the division engineer under the 1973 rules would allow groups, if they submitted a plan, to pump seven days a week -- and there was augmentation, but not total augmentation.

One of the more limiting determinations of the Special Master was that the 700 existing pre-compact wells could not pump unlimited with respect to the compact. His finding was that in the period just prior to the signing of the compact the pumping averaged about 15,000 af per year. Colorado had argued that it could have been as much as 40,000 af per year in dry years, and that it should be allowed to pump what was necessary based upon the decree of the pre-compact well. The Master put an annual limit not to exceed 15,000 af on those 700 wells, and so one of the responsibilities under the new rules is how to allocate the 15,000 af to those 700 pre-compact wells.

You heard from Jim Lochhead just before lunch about the Arkansas River Coordinating Committee and how important it was in bringing together all the diverse interests of the valley. I want to say briefly that the committee was, in my opinion, a real success, because the water users, after about three or four months of sparring, sat down around the table and for the next six or eight months worked hard on helping develop workable rules and regulations, helping to find solutions on where we could find augmentation water, and generally working together in a manner I hadn't seen in the Arkansas River Basin in the past. It is the leadership of those 30 individuals who were willing to meet monthly without compensation, some of them driving from Leadville to Lamar at times just to be public servants, that I think can be credited for the success we had thus far.

I want to take a few minutes to talk about the new rules to let you get a flavor of what we are trying to accomplish, our time lines, and where we are right now. There are two key points that I want you to really understand about these new rules. One is to bring about compact compliance. David Robbins indicated to you that we have no choice. It is the law of the State of Colorado and it is the law of the federal government. It is a compact. We have been found to be in violation, by primarily the pumping of 1500 post-compact wells.

The second issue, which I think is just as important, is that we have about 2000 wells, that may total about 2200, some of them are not always pumping in a given year and affecting senior surface water rights in Colorado. As I indicated, Mr. Kuiper in 1973 started down a path to bring the pumping by junior wells under control and require augmentation. He was not successful, but we cannot overlook all the information we have developed through the investigations related to the litigation with Kansas.

The modeling studies clearly show that when you pump wells in Colorado the primary party affected is the senior surface-water user in Colorado, much more so than any benefit to Kansas under the 1948 compact. You can't overlook that effect, and you can't do rule making, in my opinion, just dealing with the state line or compact issues. They are so intertwined that you have to deal with them together at one time, so the new rules that were filed with the water court in September of 1995 in fact deal with both. I will try to walk through some of the key parts of those rules with you so you can understand how we are attempting to bring about compact compliance and also deal with the issue of protection of senior vested water rights in Colorado.

I would like to talk about the scope of these rules. What do they cover and what do they not cover? It is very clear that you understand that they are not totally comprehensive, covering every well in the Arkansas River Basin. They deal first of all with pumping of tributary groundwater, so there are certain types of other groundwater that are not affected and I will talk about those.

The first are wells that divert non-tributary groundwater. They are either decreed or permitted to be pumping non-tributary groundwater. Certain designated groundwater basins exist in the Arkansas River Basin -- the Southern High Plains designated basin, the Upper Big Sandy designated basin, and the Upper Black Squirrel designated basin. Groundwater in these basins is not hydraulically connected to the Arkansas River in any significant way. They are under the jurisdiction of the Colorado Groundwater Commission. Wells in these areas are not subject to these rules.

Certain small-capacity wells for domestic and stock watering are exempted from administration in 37-92-602 of the statutes Any wells that fall under what we call the "exempt well" under 602 are not subject to these rules. Certain wells in the Denver Basin aquifers operate under rules promulgated in 1985, and as such they operate outside of the proposed new rules. They pump basically nontributary or not nontributary groundwater from the Arapahoe, Laramie- Fox Hills, Denver or Dawson aquifers.

Finally, we allowed two other aquifers not to be included in these rules -- the Cheyenne and Dakota aquifers. They are located in the eastern part of the basin and used primarily for domestic supply. The connection with the Arkansas River is very indirect, and so we felt we didn't have the information at this time to include those aquifers in these rules. A number of rural water associations in the La Junta, Lamar, Las Animas area use these aquifers because of the quality. They are not subject to these rules. If you represent any of those areas, I want to make clear that if you have a Cheyenne or Dakota well you are not subject to the new rules.

The rules are numbered 1 through about 18, and I want to talk about three that are the key components -- rules 3, 4 and 5.

> Rule 3 deals with the compact issue. How do we bring about compact compliance and stop depletions to usable state late flow? They have a geographic area that is very specific. It is the area that was modeled and studied in the litigation with Kansas, and it covers the valley fill and surficial aquifers between Pueblo and the state line. It involves post-compact irrigation well pumping, and basically the rule says that after April 1 of 1996 these wells cannot pump any longer, or in the alternative they can pump if they operate pursuant to a plan approved by the state and division engineers whereby depletions to usable state line flow are replaced.
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> Rule 3 also talks about how we allocate that 15,000 af of pre-compact pumping to the 700 or so wells that are pre-compact in nature. The rule clearly sets forth a procedure. We have published a table indicating how much each of those wells would be entitled to pump in the future with respect to the pre-compact pumping allowance. Copies are available through Steve Witte, the division engineer.
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> The rule uses the Kansas hydrologic institutional model to determine how well we did in replacing depletions to the usable state line flow. That is the tool we are using in the litigation with Kansas that the Master has endorsed. After the end of a year, when all the information is available, the model will be run to determine if the offsets made available by the various groundwater entities in fact did offset depletions to usable state line flow. If for some reason it did not, the shortage would be allocated among the wells on some basis of amount pumped, consumptive use, distance from the stream -- it is all spelled out in the rule. If there is a shortfall, we have to allocate the obligation to replace it, and Rule 3 deals with that.

Rule 4 gets into protection of the senior surface water rights in Colorado. Rule 4 has a very specific geographic area. It is the valley fill and surficial aquifer between Pueblo and the state line as well as the alluvium of Fountain Creek and the alluvium of the Arkansas River between Pueblo and Pueblo dam. This additional area was not modeled in the studies by either Kansas or Colorado, so we expanded the area slightly. In this area all wells, regardless of whether they are irrigation, municipal, commercial or industrial, will not be allowed to pump after April 1, 1996 unless they operate pursuant to a plan approved by the state and division engineer that replaces out-of-priority depletions to senior vested water rights in Colorado. The focus is in Colorado, so if the Catlin Canal is calling, for instance, the plan would have to show that the wells above that can replace their depletions to the Catlin call or the Fort Lyon call, or the Amity call. It is very important that we start dealing with how we protect our senior surface water rights in Colorado.

Rule 4 further establishes a presumptive depletion to simplify the process for determining depletions. Based upon the investigations and the litigation with Kansas, we have sufficient information to determine what depletions are related to certain types of irrigation applications. If it is a supplemental source of supply, if the well water is used on land that is also irrigated with surface water and the method of application is flood or furrow, the rule says the depletions are 30 percent of the amount pumped. If it is applied on land that receives no other surface water supply, a sole source and the method of application is flood or furrow, the rule indicates that the depletion is 50 percent of the amount pumped. And finally, if it is sprinkler irrigation, the amount of depletion is 75 percent. The rule set these presumptive depletions. They were negotiated over the last several months prior to the filing of the rules, and one of the key issues was to reach agreement on what those presumptive depletions should be.

Rule 5, then, covers the rest of the basin, the area outside what we call the valley fill and surficial aquifer and Fountain Creek alluvium. Everywhere else in the basin a well subject to these rules, pumping tributary groundwater, either must stop pumping on April 1, 1996 or operate pursuant to a plan approved by the state and division engineer whereby out-ofpriority depletions to affected senior surface water rights are replaced.

Discussing briefly some of the other rules in the whole set of rules that were filed with the water court -- Rule 11 allows a phase-in in certain respects. Beginning in 1996, we will not phase in replacement of depletions to usable state line flow. All depletions to usable state line flow must be replaced in a plan approved by my office. We are going to bring about compact compliance beginning in 1996. With respect to replacement of depletions to senior surface water rights, we do phase that in over two years, because it is a larger amount of water to acquire and it will take longer to develop replacement resources. In 1996, 60 percent of the out-of-priority depletions must be replaced. In 1997, all out-of-priority depletions must be replaced.

Rule 12 deals with how we get pumping estimates. All of these rules are driven by how much you pump and by applying certain depletions to them. In 1994 I promulgated rules requiring that all well owners report the amount pumped on an annual basis but providing monthly values. They must be submitted by the end of January following the water year. Those rules allow that the well owner can install a totalizing flow meter or, if the conditions are appropriate, could utilize a power consumption or power conversion coefficient to estimate the volume pumped based upon a test performed by a certified tester. Rule 12 requires that this information be provided on a monthly basis. It will go to the division engineer who would then utilize certain computer programs that we are developing to estimate the depletions as near as possible to the end of the previous month so we can get a handle on depletions, when they occur, and require that replacement water be made available to either the affected senior surface water rights or to the state line.

Rule 14 requires that an annual operating plan be submitted prior to April 1, 1996 and March 1, 1997 and thereafter. That plan must be approved prior to any pumping in that irrigation season. The sooner the plan can be submitted the better. We are working closely, with the water users for the 1996 year so that we can have as much input and review of their plan as possible prior to April 1.

What is the current status of the rules? You may be wondering where we are. As Jim Lochhead indicated, there were 18 different protests filed by the end of the protest period, the end of November. Some actually were in support. Individual well owners involved in protesting the rules who are opposed to them probably number less than 20 wells out of possibly 4,000 affected wells throughout the entire Arkansas River basin.

That is encouraging to me. It indicates that most of the water users and well owners understand what we are up against and that this is not a matter in which we have a lot of discretion on how we bring about compact compliance. As David Robbins indicated, he doesn't understand the arguments behind some of the takings issues, and we will have to let those be litigated before the water court.

The Special Master is watching us closely. I want to emphasize that point as part of my conclusion. I testified at the end of October and in early November in Pasadena last year about what Colorado was doing to come into compact compliance. I submitted a report to the State of Kansas and to the Special Master which was used to tell him where we were at that time. He made it very clear that he will to continue to monitor what we try to accomplish within the next few months.

I must testify in a hearing in March on where we are, how many protests we have had, the results of hearings by March, and what some of the augmentation entities are doing to bring about replacement of usable state line flows or augmentation of the river in Colorado. He further set a hearing in June giving Kansas the opportunity to then indicate their disagreements with where Colorado is going with respect to coming into compact compliance. I think he has made it clear that he will give Colorado every opportunity to take control of the situation and deal with it within Colorado. I think he recognizes that is the best way. We must, though, make sure that we are really and truly complying with the compact.

The Special Master also made it very clear to me that if we fail, he will not hesitate to take control of the situation. As David indicated, we could end up with a Federal River Master in control of the river, and that is not desirable. We have three federal reservoirs in this basin -- Pueblo Reservoir, Trinidad Reservoir and John Martin Reservoir -- and they could be utilized by federal entities to bring about compact compliance. I don't think we want that. In the alternative, he could issue an order to enjoin all post-compact pumping in Colorado, which is what Kansas sought in 1995, and he told them he would not do that. He wanted to see what Colorado was attempting to accomplish before he would enjoin or curtail pumping in Colorado.

My opinion is, Colorado is taking significant steps to deal with the issue. We are working on important legislation that would provide funding to acquire permanent augmentation water and provide resources to my office to enforce the new rules. We will need about nine additional staff in the field and in the Pueblo Office to properly enforce these rules. The key to success is proper enforcement so that those who elect to ignore the rules can be brought before the water judge quickly so we can make it clear that we cannot allow people to ignore this important issue. I think the water users and the groundwater entities have made significant progress in developing cooperative plans to deal with the issue. Within a matter of months, Colorado should be in a position to fully replace depletions to usable state line flow in 1996, and will have made a significant step toward replacing depletions to senior vested water rights in Colorado.

What To Do About It

Steve Arveschoug, General Manager
Southeastern Colorado Water Conservancy District

I prepared two speeches today, not both for here, but I am charged with the responsibility to offer a presentation to the Board of Deacons at the First Baptist Church here in Pueblo. When I left the house today I wanted to make sure I got the right presentation so that I wouldn't be giving you the one that was intended for the Board of Deacons but as I sat here and listened, I may have more to offer, may have more wisdom from the prophet Neiamiah in the Old Testament, than my original speech would have. In the second chapter of Nehemiah the prophet was talking to the twelve tribes of Israel. Understand that Jerusalem had just been devastated as it had over the centuries in the Old Testament, and his charge was to try and rebuild the wall around the remaining portions of the city of Jerusalem. He had twelve very diverse tribes with different leaders and different opinions on how things ought to come together. So, it may be better if I continue on with the second chapter of Nehemiah than to talk about well augmentation because we have some of the same challenges. I know that in any respect, a little prayer in this process probably wouldn't hurt matters.

Let me offer three challenges to the group today and then let me get into a discussion of a program that we think is going to make sense in terms of meeting these challenges and the things that are before us.

Our first challenge, as you have heard here today, is to understand that the court has ruled. A decision has been made, at least on the first phase of the trial by the United States Supreme Court. The reason that I reinforce that is because, in my role as General Manager Southeast District, we did a little survey. We sent out about a thousand questionnaires to well owners that are within the boundaries of the southeast District. Some of you may have received a copy of that survey. In fact, one of you may be the person I'm going to talk about in terms of responding to our survey. We got a bunch of those surveys back, but on one of the surveys there was nothing but a few words. It didn't put a name, address or any kind of follow-up that we could make. The only thing the survey said, and it wasn't even written in the lines of the comment section but diagonally across the survey, was "tell Kansas to go to hell!" Now Mark, I don't say that despairingly against you, a good neighbor from Kansas, but I share that with you because our first challenge is to realize that one, the court has ruled. We may like to offer that comment to Kansas but we have a decision by the United States Supreme Court and an obligation to our compact that we have to meet. So that is challenge number one. To realize that the court has ruled.

Challenge number two is to realize that Hal will be working over the next 30-60 days to finalize his rulemaking process, and however those rules come out we will be obligated to work within the boundaries of those rules. Whether we know how all the intricacies of those rules are going to function or not, those rules will be the game plan as to how we function and meet our obligation for well augmentation. So that's challenge number two, to play on that game plan -- those rules.

Challenge number three is to avoid competing to provide the solution. Everybody has a different sense of how we crack this nut and how we provide a solution. One of the things that I have learned in my short tenure with the conservancy district and working on this issue, that many of you have probably known for a long time, is that folks in the agriculture community are a very, very independent bunch. I would share a story about one of them who keeps time a little bit differently than the rest of us because of concerns about daylight savings time and that was enacted several years ago. But, I won't share that story. Very independent bunch, so we all have a different perspective on how to provide the solution.

We have spent the last several months working with surface right holders, augmentation groups and groundwater groups, trying to come up with a program that we thought made some sense, and we have devised what we call the "coordinated augmentation program." I am here to tell you today it's probably not a perfect program, but it's going to be a program that we're going to try to operate under, at least the first year.

Let me first give you the goals of that program are and then I'll get into a little bit more detail. First, as we entered into this discussion we felt that it was important for the district and the other entities as we looked at a program for well augmentation or replacement water that the program be a credible program. You have heard today concerns conveyed that we do not want the Special Master from the United States Supreme Court to appoint a River Master, so anything

that we need to be involved in or any program that we're going to use to comply with these rules would have to be a credible program. The second goal was that the program would have to comply with the rules. However those rules come out and regardless of what kind of questions we might have about them, the program would have to comply with the rules. And third, our goal was to try and make use of Fry-Ark return flow waters to the extent that those waters were available for well augmentation purposes. I'll talk here in a moment about how those waters might be available for use in these programs. Fourth, we wanted to make sure that the program would be cost-effective for well owners. To the extent that we can work together, we can maximize our effort and provide what we think is a cost-effective program. Imagine having all the well owners between Pueblo and John Martin Reservoir participating in one program, lowering the administrative cost and maximizing the ability of that entity to purchase the replacement water that is needed. So, our goal is to try to move toward that high level of cooperation. To work together and not compete. The boards of AGUA and CWPDA and the Southeast District have all at this point made a decision to support the coordinated augmentation program. The Board of the Southeast District acted on the 21st of December serving to hold together the work of the prior three or four months and approve the operating principles of that program.

Let me elaborate a little bit on how we envision that program working. Our first effort is to understand that we have a resource as a conservancy district available that can be used for well augmentation purposes. We have Fry-Ark return flow waters available and have in the past made some of that water available for well augmentation purposes but not to the extent that we've exhausted the resource. We have on average about 15,000 acre-feet a year, an average based on looking at the history of the deliveries from the Fry-Ark Project. That's a trans-mountain project that delivers beautiful crisp, clear, cold water from the western slope of Colorado. So we have an available resource, and our goal is to make that water available to individuals, to augmentation organizations and/or ditch companies. I'll elaborate on how that might work here in a moment. We would ask individuals or entities to submit plans to the Southeast District by the 1st of March. We're patterning our time-lines based on the time-lines described in the proposed rules. With their request for augmentation water, we would ask that entities provide us a copy of their well augmentation plan. That could either be you as an individual well owner or you as an association or group that might approach the Southeast District for use of some portion of the return flow water.

When we receive that request for our return flow water, we'll understand a couple of things. That plan will need to have other water available to it for augmentation purposes. The Fry-Ark return flows are only a component of what's going to be needed for replacement purposes, and we cannot provide the full replacement requirements of a single plan or group plan. Those plans would also have to meet a set of standards that have been adopted by the Southeast District. We want to make sure that those individual plans are: (a) in compliance with the rules, honor the policies of the Southeast District and, most specifically, honor the vested rights that we have with the surface holders that we have been appropriating first use project water to. We refer to that as the first right of refusal provision of our policies. So, plans would have to adhere to not only the rules but to the standards and policies of the Southeast District. Again, individuals who may choose to offer up their own plan and do all the compliance work on their own. AGUA, CWPDA, LAWMA, and other organizations will approach the district for an allocation of that water and/or ditch companies who may choose to exercise their first right of refusal may come to the district seeking portions of that return flow water.

Also contained in the principles of the coordinated augmentation program is what we describe as an alliance agreement between AGUA and CWPDA. LAWMA is focused on doing the work below John Martin, AGUA and CWPDA are vigorous in putting together plans above John Martin to Pueblo Reservoir. We have asked them as co-signers on this program to look toward consolidating into one organization in an effort to try and achieve one of our goals, to see one organization providing the services for well owners who have replacement water needs. So, a main principle of our program conceives consolidation of those two organizations over the scope of a year. We're not sure how that consolidation is going to work; in fact, we're not sure whether they are going to be strange enough bedfellows that the consolidation will be a strained relationship. It may be a strange relationship too. But our effort is to pull together our resources and see those two organizations merge into one. It's a first-year effort. The Board of the Southeast District as well as the other co-signers of that document plan to review that at the end of the first year to gain an understanding of whether it has met our goals, for compliance with the rules, and to meet the obligations as prescribed to us by the Special Master of the Supreme Court. So, we will be going back to the drawing board at the end of this first year to see whether we have achieved what we hoped to achieve with this coordinated augmentation program.

We're not the only effort out there. Hal has mentioned that he will be pursuing legislation at the state capitol concerning financial resources and enforcement resources that he feels, and we would agree, are needed to do an effective job in the

valley for well augmentation purposes. So, our challenge is that the court has ruled, that we have to work within the framework of the rules and that we've got to work together. We may want to tell Kansas that there's a different place that they ought to reside, as our respondent to our survey indicated, but we're not in a position to do that. We've got the game plan laid out before us, and it's a matter of working together.

I will give you one other note in parting. I'm new in this process, and as was laid out earlier this morning by Chuck Lile, this discussion with Kansas has been going on for quite some time. I was going through the archives of the Southeast District and I happened to find a letter dated 1964 written by Frank Holt, Jr. who was the publisher of the Pueblo Chieftain or the Pueblo Star Journal at that time. The letter was written to an editor of a newspaper in Wichita, Kansas and I cannot recall the editors name, but the letter said, "You may accuse Colorado of many things, but don't accuse us of stealing your water." The newspaper in Wichita had written an editorial claiming that Colorado was proposing to steal water from the Arkansas River that ought to be Kansas water or water that would have ended up in Kansas via a cloud seeding proposal. And so I will continue to do my research and learn of these topics but be diligent in following the guidelines and wisdom of the prophet Nehemiah in trying to build a new all around Jerusalem and find a solution in well augmentation in the valley.

Q. Untranscribable

A. It is my understanding that the well augmentation organization would serve as your compliance conduit with the division engineer's office to the extent that they are going to handle the paperwork for you. You're going to pay them an administrative fee and they will have the paperwork responsibility with the division engineer, although the rules are directed specifically to you as a well owner. Hal may want to provide some additional light on that subject.

(Hal Simpson) Steve is correct. The rules allow an entity representing a well owner to submit certain information, I believe it's in rule 13. You have to sign an affidavit that the information is correct as a well owner, but from that point on that information doesn't change and you pay your administrative fees and your fees based on the amount of water pumped. You should be able to then rely upon the augmentation entity whether its LAMA, AGUA, or CWPD to take care of all the necessary paperwork and reporting after that time.

Q. Untranscribable

A. They're the same as for the entity or the augmentation association. They're set forth in the rules. What you would have to submit, when you'd have to submit, and what type of information you'd have to submit on a monthly basis. It's all in the rules.

Q Untranscribable.

A. They've already been published. They're, in my opinion, effective January 1 of this year. That's the position we're taking, that they're now in effect. Certain parties did protest, as I indicated. There will be eventual litigation on maybe potential changes to the rules, but in the opinion of my legal staff they are in effect and that is the position we are taking before the water judge in any of the hearings that will be set in the next couple of months.

They were published in the newspapers throughout the Arkansas Valley. There's a statutory procedure, under Colorado Statutes 37 and 92-501, I think, that set forth how that will occur and that was followed.

Q. Untranscribable.

A. The entire basin with the exception of those areas that I talked about excepted in the scope, the designated groundwater basin in certain non-tributary aquifers. Any well that pumps tributary groundwater that is not excepted would be subject to one of the rules, rule 4 or rule 5. If you have a question, there is a map that is appended to the rules that sets out the areas. You can obtain the rules at Steve Witte's office, the Division Engineer's office. There's a map on the back that shows exactly what areas are excluded from applicability of the rules.

Q. Untranscribable.

A. I don't know the number.

Q. Untranscribable

A. (David Harrison) Let me address that before Hal. Remember, a 1946 well is not in priority in the Arkansas basin as against the Catlin Canal or the Amity Canal or the Buffalo Canal except for a few days every year. The issue of pre-compact and post-compact is effectively insignificant when it comes to these rules, because all the wells that are junior to 1900 are going to be looked upon by the senior surface ditches to replace their injury to those ditches. It is 15,000 acre-feet only runs; it only provides an off-set for pre-compact wells as it relates to the Kansas obligation. So, there doesn't need to be a whole lot of determination about when a well is in or out of priority vis-a-vis the compact. The issue is whether or not the well and its subsequent depletions will be in or out of priority vis-a-vis all the senior water rights of Colorado. A 1930 water right, for example, would have no significance at all for the bulk of the replacement obligation that most wells have. That obligation runs to those people in the audience here who own the senior surface rights who the studies have now shown the wells are impacted. Let me say one other thing about the 15,000 acre-feet. That was the best that Colorado could do. Colorado's own evidence, evidence that was produced in prior proceedings, suggested that the amount of pumping by wells that existed prior to 1948 was in that vicinity. The Master didn't grab this out of the air. The State of Colorado and water users in Colorado had used a number similar to that in previous Colorado proceedings that were of record and were introduced into evidence in this case. Colorado's efforts to tie the amount of pre-compact pumping to the wells' water rights adjudicated in 1972 weren't successful, in part because our own people, in prior administrations and prior generations, had taken the position that the amount of pumping that had occurred was about that amount. It's a fact of historical evidence that existed within Colorado's own archives that led , in part, to that number. So I just wanted you to be clear on that.

(Hal Simpson) David's correct. If you have any more specific questions, I'll take a shot a them.

Q. Untranscribable.

A. When you say, " those wells," you're talking about pre-compact wells? As David indicated, 99% of the time any well will be subject to call by a senior water right, senior surface water right. It's going to be very unusual, but this year was one of those years. We had John Martin filling and the call shifted, I think significantly; in some places there was no call, and so under those conditions wells, had they been operating under the rules that I am proposing, just would not have had to make a replacement because nobody was being injured. But soon as John Martin started storing again, the call went back to 48, the call gradually came on more senior route irrigation season. In most cases, 99% of the time or 95% of the time, wells are going to have to replace depletions to senior surface water rights. The 15,000 only comes into play as determining what we owe Kansas as far as replacement to useable state line flows.

Let me make one other point about wells. Remember, a well's impact on the stream is not an instantaneous impact. It is almost always a deferred impact, and so the fact that you have two days where you have a free river, assuming you don't have any surface water rights, you can go ahead and pump your well. The problem is, that maybe for that two days, first of all, you're not going to have any impact on the river anyway because the well's impact won't get to the river in those two days, a week, two weeks, a month later your impact arrives at the river. Now, the call is 1876. You still owe the water even though the pumping occurred at a time when there was a free river, so looking at priority and looking at how we have to work wells back and forth is more complicated than simply saying, "If there's a free river I don't owe anything." That may be true on that day, but that doesn't mean that the impact caused by your pumping that occurs when the call is against the Amity's number one or something won't be required to be replaced. It will. That's why using a well association is such a good idea for most well owners., because they will acquire larger blocks of water that they will have available to take care of these variances in how the demand and the supply match up vis a vis well pumping at a particular time.

Agriculture

Jeff Tranel
Agriculture and Business Management Economist
Colorado State University

I'm going to talk about the economic value of the river for the counties in the basin. I'd like to narrow the basin down somewhat for the following discussion to eight counties - Lake, Chaffee, Fremont, Pueblo, Crowley, Otero, Bent, and Prowers. I realize that other counties in the district are directly and indirectly impacted by these counties and the river. Also, I would like to focus on five primary irrigated crops - alfalfa, corn for grain, sorghum for grain, winter wheat, and vegetables, sweet corn and melons. These are the primary crops according to Colorado Agricultural Statistics, 1992.

Colorado has almost 11 million acres in crop production, and the eight counties listed above have 0.8 million acres of crop land. Approximately 50% of the irrigated crop acres in Colorado and 66% of the irrigated acres in the Arkansas River valley are used to produce alfalfa, corn, "vegetables, sweet corn, and melons," wheat, and sorghum. Furthermore, 14% of the acres on which these crops are produced are contained within the river valley counties.

The acres of these five crops in the Arkansas River basin totaled 215,348 in 1992. Gross sales were approximately $62.00 million. Alfalfa accounted for about 50% of the total value of the five crops.

"5 Primary" Crops in the Arkansas River Basin

	Acres	Gross Sales	
		Million $	$/Acre
Alfalfa	119,600	31.3	262
Corn	48,900	16.0	327
Vegetables	6,848	8.4	1,227
Wheat	19,700	3.5	178
Sorghum	20,300	2.8	138
Total	215,348	62.0	

Agri-business includes farm production, agicultural inputs, ag processing, and marketing. Income is sales (marketings and government payments) less costs. The total agri-business income for the eight counties exceeded $152 million in 1992. Pueblo County had the highest agri-business income at $51,483,000, while Lake County had $56,000 of such income.

Agri-Business Income By County ($1,000)			
Pueblo County	51,483	Bent County	9,937
Prowers County	37,291	Chaffee County	2,015
Otero County	34,792	Fremont County	2,012
Crowley County	14,727	Lake County	56

Labor and proprietor (owner and operator of an agri-business) income is one indication of agriculture's importance within the eight counties and Colorado. The labor and proprietor income in 1992 for all agri-business was $152,313,000 in the eight counties and $2,295,000,000 in Colorado. Farm production accounted for $98,385,000 and $873 million in the eight counties and Colorado, respectively.

The agri-business dependency of any particular county is the agri-business income as a percent of total income within a county. Counties receiving over 20% of total county income from agribusiness industries are considered "agri-business dependent". Those counties receiving 10% to 20% of total county income from agribusiness industries are considered "agribusiness important". Colorado has nine counties classified as agribusiness dependent and 11 counties as agribusiness important. The data it shows that Jefferson county and Kiowa county are the two most agri-dependent counties in the state of Colorado.

Agribusiness Dependency by County			
Crowley	29.4%	Pueblo	2.6%
Prowers	17.3%	Chaffee	1.1%
Bent	11.9%	Fremont	0.5%
Otero	11.2%	Lake	0.1%

In closing, I would like to point out that there is a publication written and available from CSU Cooperative Extension and Experiment Station regarding the "Colorado Farm and Food System" and its contribution to the state's economy. It contains all the data discussed above. Please contact my office for a copy.

I would like to add that I did not use any multiplier effect. Dr. Dana Hoag, who spends quite a bit of his time at CSU looking at the food and fiber system and ag policy issues, cautions against using multiplier effects on a wide scale system like this. Multipliers cause the data and intrepretations to become too general and inconslusive. It would be incorrect to use a multiplier of 2 times 3.7 million dollars of gross sales and get the effect. Rather, a multiplier of 2 would allow you to show that if sales were increase by $100,000 dollars, the impact of that 100,000 would then become 200,000.

I've tried to point out some aspects of the economic value of the river to the eight counties within the river valley. I believe that the river plays an important role in the economy and society of the Arkansas River basin.

AGRICULTURE

Richard Hallock
Community Development Specialist
Colorado State University

Let me say just a word about the genesis of my brief presentation. In one of the earlier planning sessions someone said, "You know, there are going to be some people out there, maybe a very few people in the audience, who really don't understand the distribution and management system that has grown up over the years on the river." Then someone else said, "We have to be sure to get someone to explain this in the simplest of terms. It would not be a good idea to get a nuclear scientist to explain how a light bulb works as no one will ever understand it." Someone else then said, "I know just the guy who knows the least about the river of anyone." And, that's why I'm here. I guess I first need to say that those of you who are professional water folks and have been looking forward to an opportunity to take a brief nap, feel free. But, I do need at least one of you to stay awake to call me to task in case I get something wrong here.

The river actually operates under two systems. The first of these two systems is the Fryingpan-Arkansas system, which Steve Arveschoug earlier described. You have heard folks talking about rights and dates and acre-feet, and for those three or four of you who might not understand that any better than I do, it's kind of a confusing issue. But one thing is quite clear, and that is that the water which is provided through the Fryingpan-Arkansas process is not a part of that established rights system. It is a separate thing. It is new water that has been added to the river basin since those rights were all adjudicated, and it provides supplemental water to those people who already have established, adjudicated water rights. It supplements municipalities' adjudicated rights, it helps to irrigate 280,000 acres, and as you are well aware, it certainly helps to provide continuous recreation in the upper Arkansas. About 69,000 acre-feet pass down the river bed each year as a result of the Fryingpan-Arkansas process; up to 740,00 acre-feet are permitted to be stored in years when we have all the water we need. Seven hundred forty thousand acre-feet of the stored water will be Fry-Ark water, the balance of the water stored in the basin, about another 740,000 acre-feet will be normal, standard, run-of-the-mill river water. Five reservoirs are involved in the Fry-Ark process. Pueblo Reservoir stores 50% of the total of the Fry-Ark water. This water is allocated annually by the Southeast Water Conservancy which Steve heads up. And it's sold. People pay for the water they get through the Fry-Ark system.

The other system is the natural river system, which is totally committed. In 29 of 30 years, essentially every drop of water is committed to someone who has the rights to use the water. There are 7,500 cubic-feet-per-second of water which are owed to somebody down the river. And, only one year of 30 on an average, as I understand it, is there a point in which the river is called a free river--when there is, at any given time, more than 7,500 acre feet flowing in the river. At that point, then, those who have an additional need for water may request it. It is then assigned based on their original priority, if they have any. In 1995, there were three weeks that passed when the river was designated a free river and extra water was available.

Over time, using John Martin and other reservoirs, there is a total capacity in the natural river system for storing 741,000 acre feet of water. Thirty-five percent of that water is stored above the Pueblo Reservoir, and 65% is stored in or below Pueblo Reservoir. Only 15% of the stored water is used above Pueblo, and 85% is used from Pueblo on east to the Kansas border, so obviously, most of the water is used east of Pueblo.

I've elected to display only slides of Pueblo east, and these are just line diagrams and not detailed drawings. Also, you will note that water district lines are shown on the slides. There are several water districts involved between Pueblo and east and the upper regions of the river as well. But, because 85% of the water is being used east of Pueblo, I've elected only to use those two slides. The big blue dots are the reservoir system, the ditches are shown in lavender. Lavender is not really a standard mapping color, but there you are anyway. I asked a couple of professionals how many miles of ditch there are in fact, and nobody knows. These slides show just the main ditches; obviously smaller ditches lead from the main ditch, and still smaller ditches go to individual fields. I am sure there are probably thousands of miles of ditch in all. Now, for those of you who really don't know what the hell is going on, I decided to show you a ditch. (slide) That is a ditch. That is the Fort Lyon Ditch where the water is taken from the Arkansas and put into the Fort Lyon Ditch.

Now we are going from large to small. (slide) This is a moderate-sized diversion, (slide) this is a smaller one and (slide) that is a pretty small one indeed.

Obviously it takes a complicated establishment to manage this water, since I told you that every cubic foot of water is accounted for; is owed to someone. Someone, somewhere, has to manage this. So the question is, how does that get done? First, all of this water has been allocated by date based on the time that a court of law made a decision that an individual ought to have the rights to use that water. You might be interested to know that the first court-adjudicated date on the Arkansas is the first of April, 1861, and it allocates seven feet of water to the Pueblo Water Works--that's Alan Hamel's seven cubic feet of water. The latest is the 10th of February, 1939, and that doesn't allocate water to anyone but does legally permit storage in certain reservoirs. The biggest user of water is the Fort Lyon Ditch, which is authorized 900 cubic feet of water per second, and, its first right is April, 1884, which means that a lot of people between 1861 and 1884 have rights to use the water prior to the time Fort Lyon gets any of it. The smallest user is Johns Manville, which has an 1890 right authorizing them to 3/10 of 1 cubic foot per second. Now, if you really want to know who has what rights, you would have to look at this chart. And, as you can see, over on the right and left columns there are dates going from 1861 all the way up to 1939. In the middle across the top are the users, and the amount they are authorized to use is in the center of that column. I can make it eve easier on you by showing you a corner of that chart. (slide) So, over in this column are the dates, up across the top are the people who are authorized to use the water and the amounts of water they are authorized to use. Look here. This one, the Canyon City Mill, is authorized 19 cubic feet in 1863 and another 3.5 cubic feet in 1864.

Now that's pretty complicated, and I'm glad I'm not the guy that has to say, "You can have a bucketful, you get a wheelbarrow full, you can have all you want," and so on down the river, especially to the independent farmers who don't take these types of decisions lying down. But there is, in fact, as you might have suspected, a means by which this is indeed controlled. As I showed you, there are a number of districts. Each of these districts appoints a district manager. He has at his disposal some automated capabilities. This slide shows the automated capabilities in the river. At more than 80 spots in the river, there are data collection platforms that measure the velocity and flow of the water and can measure ph and certain other elements as well. All of the 80-plus spots measure the volume; only some of them measure the other elements. These measurements are broadcast by these stations to a satellite. The message comes back to the processing station in West Virginia, goes to the computer, is processed, then back up to another satellite and, finally, back down to receivers, one of which is probably sitting on the desk in the study of the District Manager of District 14. These satellites update his data every four hours. And, if he wants, he can produce a chart like this (slide). This chart shows the report from every station, all the numbers involved from every station and the time of the report so that the District Manager will know how much water is where and when.

Unfortunately, that's the end of his automatic capability. From that point on, its a pick-up truck, rubber boots, telephone, wrench, do-it-the-hard-way kind of a process.

That then explains in about 13 minutes what it took 134 years to put together in terms of a water system. Now there will be time for questions, but there's no point in asking me any questions because I've just told you all I know about the river.

Colorado State Parks and Recreation Department

Paul Flack, Hydrologist
Administrator, Colorado State Parks

When Steve Reeves asked me to fill in for him my immediate response was "Why me?" I don't hunt, I don't fish, I went on a rafting trip where I had to change my underwear about three or four times, and that's about it.

I don't have much of a life, and the people out there that know me will attest to that. So, as Steve was quick to point out, there were actually four or five other people that were asked to talk before he asked me. Mike French declined because he said he would be with the Governor all day. Right! The thing that scared me the most was that he said, "Well, Paul, you might as well do it anyway because you're the water expert." And I immediately froze. My God, he had said those words. Water Expert. I would rather light my hair on fire than be called "Water Expert." What is a water expert? Nobody knows. So I went to my Funk and Wagnel and looked up the term "water expert." And by the way, it was thought that the two worst words anybody can be referred to as were "water lawyer," but that's not true; it's "water expert."

There are a lot of definitions for water expert; I won't go through all of them:

somebody who describes the congressional budget debate as speedy;
somebody who thought the Arkansas and the Ark-Kansas were two different rivers;
somebody who goes up to a bartender and orders a fifteen when actually he wants a seven and seven;
somebody who thought all the "Stop and Go's" along highway 50 were merely public restrooms;
somebody who thought a Rocky Ford Melloneer was somehow related to the deer family;
somebody who had the idea that outdoor recreation was merely drinking beer in a lawn chair;
somebody who thought "honey-dew" was a weather term;
somebody who wears penny loafers because lace up shoes were just too gosh darn complicated;
and finally, somebody whose family tree doesn't fork.

My father was in the water business for 35 years, and he always warned about an engineer who tried to be a water lawyer and he always warned about a water lawyer who tried to be an engineer. Now you're going to find out about something even worse, a hydrologist talking about economics. By the way, a lot of people ask me why, since I'm in the same business that my father was in, we never went into business for ourselves. Given the fact that our last name was the same and the only title we could only come up with for our company was Flack and More Flack, we decided we would move onto different horizons. So I will just simply say that I decided, since economics is not really my forte, that I would tape the speech that I'm about to give and maybe I could jazz it up a little bit besides just the usual plain numbers and facts, so I did that last night. I taped this speech and put it up on the podium and sat out there in the empty room, and when I woke up I decided that maybe I should just stick to the facts. So pencils ready and here we go.

The state park economic impact report of 1993 shows that there is $2 million total economic impact upon local communities for every 100,00 visitors to a state park and this should hold true also for the Great Plains Reservoir should a recreation area ever be fully developed there. In addition, the towns of Leadville, Salida, Buena Vista, Canyon City, and Trinidad, as well as smaller towns in the Arkansas Valley, all derive value from parks whether it is the quality of life or economic values. Buena Vista, Salida, and Canyon City have all developed river parks as well as Pueblo, and use of those parks and in these areas is important both economically and to the quality of life. Towns like Salida have publicly recognized recreation as playing a significant role in increases in sales taxes receipts. Both the cities of Lamar and Trinidad have supported parks in their efforts the past year, again recognizing the economic impacts.

Specifically, at Pueblo State Park in 1995 revenues at the park were $670,000. Visitation at the park was 1,415,000, and the economists tell me that that translates to about $30 million in annual economic total impact. At the Arkansas Headwaters recreation area during the summer months of 1995 total visitation was almost 460,000. That's an increase of over 64% since 1990. Again, the economists have determined that total statewide economic impact of the Arkansas

Headwaters recreation area is well in advance of $60 million annually. I'll throw out the numbers we always use: fishermen spend about $33 a day; private boaters spend about $37 a day; commercial boaters and people using commercial boating $73 a day. There's an asterisk there so I don't know if that includes beer money or not. And then $20 for all other activities.

Parks is currently in phase five of a six-phase capital development program with expenditures in excess of $6 million dollars at the headwaters park. This money is derived from various government agencies. Getting into an area that I hope is a little more technically my area, at all of these parks our visitation is directly related to water. I am happy to say that I think we have a deal worked out now so that we will be able to store at Trinidad Reservoir an additional 11,500 acre-feet this year for recreation and newly allocated space by the core. We will keep our fingers crossed on that.

Because water is so important, we at State Parks have become very active in the water community along the Arkansas. Historically high priorities for water use has either been agricultural, municipal or industrial. If you look at the priorities for water projects, water use in the valley, if you have the patience and the time you will go through all the priorities and then finally you will hit recreation, which is usually right down there at the bottom. But I think that is going to be changing quite a bit as it already has changed quite a bit in the last ten years. State Parks will have to adapt and plan for that change. Water leasing, purchasing and most importantly working cooperatively with the water community and water users will become important goals for us at Parks in the months and years to come, especially our role in the water community and working cooperatively with water users.

This past year the Arkansas River Coordinating Committee proved to be a valuable forum for us at State Park to converse, share, argue, and stomp our feet with other valley water users. That kind of dialog is good for us and I hope it is good for the users as well. We expect to use these discussions as a base to expand our cooperation throughout the coming months. We fully realize that not everyone agrees that the highest value should be recreation, but that's O.K. I'm reminded of a complaint that we received from some of the downstream folks saying that because of Parks they see a lot more license plates from a particular state. I won't mention that state but it sounds a lot like Texas, and I guess the viewpoint was that all of these tourism and recreational demands were not good for the valley. I guess my answer to that is it is just a matter of perspective. If you are a shop owner in Buena Vista, then perhaps those Texas license plates aren't so bad.

Heavy out of state use also has caused state parks some problems. It reminds me of this past summer at Pueblo state park. I was riding around with the park ranger and we pulled over a truck pulling a boat. I will say the truck was from Arizona this time because I'm from Arizona. The park ranger went up to the cab of the truck and politely declined the cold brew the guy offered and proceeded to discuss with him that while it wasn't illegal in the State of Colorado to tow a boat it was advisable to use a trailer. Needless to say, the beer offer was withdrawn quickly. The sad part about it was he lost his water skier about two miles up the road. True story.
But the point is, recreation plays a major economic role. It doesn't matter what part you talk about it has an impact, and that impact is often far-reaching.

I'm going to leave you with one of my favorite water expert stories. There was a farmer who was driving a load of water experts in the back of his pickup across the Pueblo dam road. The farmer lost control of the pickup and it fell off the dam and sank to the bottom of the lake, but fortunately it landed upright. The farmer was able to swim out, get to the top and get to the shore. And he waited and he waited. There were no water experts. Finally, one popped up, another one popped up and another one popped up. they swam to the shore where the farmer was frantic. "Where have you guys been? What took you so long?" The water expert spoke up and said, "We would have been here sooner but we tried like hell to get that tailgate down." Think about it.

Economic Development

Alan Hamel, Executive Director
Pueblo Board of Water Works

It is certainly a pleasure to be here this afternoon and have an opportunity to talk. I was sitting at lunch today hearing Judge Tracey speak, and it made me reflect back to exactly a year ago today, and it happened to be that the Pueblo Water Board was in Judge Tracey's court. We had before him a lawn-water irrigation return flow case. There were several people that were trying to attend this Forum along with some of our staff and we were bouncing back and forth between Judge Tracey's court and here at USC. We actually had that trial continued and this August, through stipulation, we were able to settle that case. That case was one of seven cases that we have been involved with since 1982. Carl Genova was here earlier, Frank Milenski is out here now, and there were many others who were objectors in the case, but they were good neighbors and I haven't had a chance to thank them. It took us about 13 years to go through this process - enhancing, securing and protecting Pueblo's water rights and we were able to deal with issues and continue on in a professional friendship that I appreciate. I haven't had an opportunity to publicly thank Frank and others and I would like to do that at this time.

I think it is really a given that no community can really have a good quality of life, or prosper or hope to grow without good utilities, particularly water. Instead of spending much time with that, I thought I would try to do three things today. One, talk about how the Board of Water Works of Pueblo has been directly involved in economic development in Pueblo. I think many of you realize that Pueblo has been very aggressive in economic development back to about 1980. And it was out of need: with CF&I's cutbacks and unemployment at close to 20%, we had no choice. We've been able to lower that employment down to the 4-5% range, so over the last 15 years we've worked hard at it. The Board of Water Works of Pueblo has been part of that. Today I'm going to give you a little overview of our system and what we needed to do to be a partner in that. I will also talk about a new project where we're going to use water even more aggressively to go out and seek business, and then in closing, Bob mentioned our Historic Arkansas Riverwalk Project. It is something that we, as a community, have worked hard on. I think Pueblo was very positive in this last election by approving an extension of our ½ cent sales tax for our economic development, the expenditure of some additional revenues we had over our Amendment One cap, and also put in place the funding for this Historic Arkansas Riverwalk Project. I would like to take some time and use it as an example, because all of these are related to water and a community's economic development..

The Board of Water Works' role in economic development goes back many years, and to really have success you have to have a failure. Back in the late '50s and early '60s Pueblo lost a couple of very big industries because it didn't have the water or the water system to provide dependable service to those companies. One was Kodak, which moved to the north -- we were in the final running for that company. We realized then that we had to, as a community, turn things around. We're kind of unique in that we are the only municipal water system in the State of Colorado that has an elected board. We are autonomous from city government, work closely with city government, but live totally off water revenues. The community elected some very aggressive, long-range thinking directors for the board. We worked very aggressively in the '60s, '70s and early ' 80s in acquiring water and renewing our systems. Today we are in what I think is a very enviable position -- to be able to say that we can attract or serve in a drought year some 360,000 people and associated business and industry. We have also developed a water treatment plant that will serve our needs through at least the year 2010. You must be able to produce high-quality water to attract industry. We have a modern delivery system, we're sound financially, and we're proud of the fact that we have one of the lowest water rates along the Front Range compared to the major utilities. I think we're right close to second from the bottom at this point.

From a water perspective, I think the first thing that a community must do is look forward 40 to 50 years. When you talk about water and economic development, developing a good system is the first step.. In 1984, our board decided to take it a step further. We put in place a moratorium that waived front-end fees for new businesses that moved to Pueblo. Once they're here, they pay the same fees and rates, and all the same rules and regulations apply. But we wanted to attract them to Pueblo. We would put a water connection right up to their property line. In addition, we found that certain industries want certain types of systems; they may be high fire demand systems, so we spent quite a few dollars

and we are now at a point at the Airport Industrial Park where we have a dual system; if either of the systems fail, the other system will carry it, meeting all the current fire codes requirements. That allowed us to attract UNISYS and Target warehousing because they did not have to come and spend 300,000-500,000 dollars in their businesses to put in fire protection systems. Since 1984, the board has invested about $1.75 million in that effort, but it is paying dividends. We have realized in the vicinity of $300,000 dollars worth of additional income annually for those businesses that have moved to the airport. We're getting a good return on our investment.

This past year the board has spent a lot of time saying, "We've worked hard these past few years to enhance and secure our water system, but what else can we do to help Pueblo Economic Development Corporation, who is our marketing agent for Pueblo? PEDCo goes out to attract these new businesses. What can we do as a utility to assist PEDCO? We decided that we would try to assist PEDCO and go out and find water intense customers that are clean industries and would be good for Pueblo and this valley. I think when communities in our valley grow it benefits all, whether it be a prison in Ordway or Florence, or a new business in Pueblo or Colorado Springs. Our community's citizens are very mobile and that provides jobs for our families and a future for our children. What we're in the process of doing is developing a marketing plan that actually the Board of Water Works will fund. We're going to first go out and identify high water consuming industries that might look to locate in the Pueblo area. This might be canning, bottling, microchip manufacturing type industries that are water intense but clean, and would be good for our area, our communities. We're also going to try to identify the factors which influence their decisions to relocate and to expand to a new area. We are then going to develop a marketing campaign and then we are going to reach out. We're going to send that marketing campaign out throughout the west. We hope to get some bites, and we will then form teams of elected Board of Water Works board members, PEDCO board members, and staff from both organizations to go visit these industries, wherever they may be, to bring them to our valley and to Pueblo.

We have taken the first major step. We're doing some local gathering of information and searching of records in developing preliminary marketing material. We've also retained the services of a marketing firm in California. That is going to be our first target or area and they're going to assist us in that process. We expect to expend some $80,000 over a 8-10 month period trying to attract businesses.

The next project I want to talk about I will refer to as HARP -- the Historic Arkansas Riverwalk Project. Water has played an important part in this valley, not only to municipalities but to agriculture. Pueblo has grown up around water. Water has been an important part of our history. We wouldn't have been able to have the vital economy we had and industries like CF&I without water and the Arkansas River. I'm going to talk about the purpose of this project, and then I'll show a few slides. This project will improve the quality of life in Pueblo. It will be an urban park, an entertainment center. We also feel there are great historic and educational benefits that we can provide in such a riverwalk and, finally and importantly, it is an economic development project. It will improve the tax base for both property and sales taxes. It will create jobs, some 300 jobs during construction and some 250-300 permanent jobs. It enhances our ability for tourism and complements our new convention center and hotel that will be located adjacent to the project. I will touch on that shortly. We feel that it will have an economic impact to the tune of $3-$5 million per year on Pueblo as we build the project.

An important part was the election that we had in November, and I'm going to touch on that just a little as we go through these slides. I thought first it would be interesting if we could look back in time with a slide of the river, because it has played an important part in Pueblo's history. I think many of you realize that the Arkansas river, particularly the point close to or actually on the site of the Historic Arkansas Riverwalk Project, played several important parts in history. If you go way back you would find that it was the border between the French and Spanish territories, later U.S. and Mexico. Pike's stockade is actually located on the project, and I'll come back to that a little later. It's actually about a block and a half south of where Fort Pueblo is. The river has also had some devastating effects and to see what the project is, you have to think of the history because the river got moved in 1921. Originally the river flowed right past City Hall. This is Union, South Main and this is Santa Fe. The 1921 flood changed that. There were over 100 lives lost, $19 million in damages, and I think 60% of the businesses in downtown Pueblo were eliminated. Here again you can see the channel. In 1922, the river was relocated up against this bluff, a levy was put in, and over time two or three of these blocks were turned into parking lots. Here are some more pictures of the damage done in 1921. That's up

about 12 feet on the side of city hall, right there at Elizabeth and Union was the high water mark for the flood. And along with putting in the levy, 1962 began the installation of the Pueblo Reservoir. So we are now flood-protected; the river flows in a channel and will no longer cause those types of damage in the future. And here it is, The River Rolls. That's just the day after the election in Pueblo. I'd like to work my way back from that for just a minute and talk about how the riverwalk came about. In that picture is Pat Kelly, who is our current chairperson for the HARP Commission. With her is Vera Ortegon, one of my new board members, whom we'll be working with over the next six years. Back in 1991 a group of us got together and talked about the historical significance of the river and the need to enhance Pueblo's downtown and what we might need to do that. A good friend of many of you in this room was part of that original meeting; that was Tommy Thomsen. He went on to become the chair of the HARP which began as a committee, later became a commission of city council and now has 15 members that are appointed. It started with a group of about six of us and really was a cross-section of our community. At this point, we have a collaborative effort of the total community: the city of Pueblo, the Pueblo Conservancy District, the Board of Water Works of Pueblo, both Chambers of Commerce, WestPlains Energy, and since then all three of the local business associations are now part of our project. The enthusiasm has spread - professional people, attorneys, dentists, doctors, bankers -- and it has really been a community effort. We spent some four years and probably about $ 500,000 in research and planning to take us to election November of this year. We did ask the voters for the authority to go out and borrow $12.8 million. That is not the total cost of the project. That's the total cost of the infrastructure of the public portion of the project. A major part of this will be public/private partnerships -- a lot of private investment in this riverwalk.

With this election now behind us, we are moving forward in that planning process. I'd like to walk through the project. On this side is a total slide of the project; I'll refer back to it from time to time. This is a central Pueblo concept map. I-25 is here, the Art Center is here, and will anchor one end of this project. Union Depot is right back here. Here's the Arkansas River in its current channel, here is the central part of this context area and that is the HARP project. As you look at the project, this is WestPlains Energy's distribution offices, engineering offices and their power plant. Here is the site for the new hotel/convention center.

There are multiple parts of this project and I'm going to walk through each part of the project. There will be private portions, not to be developed with the bond money and the public money. This is what we hope to entice or bring developers in to do, hopefully local developers, because we think we can put it into small enough type projects where local developers will be the investors on this project. The first segment is what we call Lake Elizabeth, this is Victoria Avenue, WestPlains' power plant sits right next door to this. This is one of their cooling ponds, there is another one just to the west here. For the last 30+ years these two blocks have had piping and have been parking lots so WestPlains' water right, which I'll get into in a little bit, has flowed underneath, as have all the central storm sewer systems. This area, Lake Elizabeth will have a promenade, an area to walk, small seating area, and here is our residential component. We envision apartments being placed here on the north shore of Lake Elizabeth. Here's a closer view.

The next block moves into the urban core, the activity portion of the project. This is Victoria, this is Union. In total the project covers about 26 acres and about 28 linear feet of navigable water. Here is a small taxi, water taxi and you will be able to take a water taxi from up around here - this is the convention center and new hotel. You will be able to get on a water taxi, come down to the main channel, come up here to Victoria, turn, get off, stay on, or visit the businesses in that area. Come down almost to Santa Fe, make a turn around and come back up to the convention center. So it will be navigable. There's a side view, the whole river channel and all the areas in blue on the map to your left will be approximately 8-10 feet below street grade. I don't know how many of you have been to San Antonio, but this will have a similar look to San Antonio, while unique to Pueblo and Southeastern Colorado architecture and design. The channel itself is about 30-50 feet wide, probably 3-4 feet deep at most spots. Just a view on the other side. This would actually be street level here. There will be restaurant-type businesses, commercial type businesses that open onto the riverwalk, there will be patio areas, dining areas, and we imagine office, restaurant, retail on the street level and possibly a second story. Now right here will also be underground piping to keep all storm water out of the project and to be able to take WestPlains Energy's water right, if necessary, for maintenance around the project so they can continue to operate. This is the area between Union and South Main, and City Hall sits right here. This is going to be a big amphitheater area for entertainment and art. Moving along across South Main -- another commercial area and then the link up to the convention center. Here again, this is 8-10 feet below ground. We envision at some point in the future

additional need for other hotels, and looking for those along this area right here. Moving down into what we call the Historic/Interpretive Park we find Pike's Stockade was located right about there. We plan on development of wetlands, educational centers, some theater areas where we can have some displays, so we have a lot planned for this area. It's a more passive area. We also separated walking traffic and bicycle traffic, and this will be linked to the river trail that goes from U.S.C. out around Pueblo Reservoir. They will be able to come to this river system without having to cross a city street.

We have two plans in place to provide the water. One is to use the return flows and tail water from WestPlains' power plant. They have a 200 CFS decree and historically divert between 30-90 CFS. Their diversion is up here on the river. They bring it to two cooling basins, and then return it here and it eventually gets down to Runyon Lake and returns to the river. That's going to be the primary water right. In 1993, the Board of Water Works also filed for a junior water right, (direct flow water right), of course it will not be in priority often. So, as part of that decree we have a plan for augmentation to make out of priority depletions. Also, we filed on the tail water of WestPlains Energy so that we could protect this segment and the water in this segment.

Our plan is to break ground in June. We plan to be complete with the infrastructure portions in three to four years. That's not all the commercial development -- it will come as we can promote and entice businesses and developers to locate in the area. But, the infrastructure will take us three to four years and we are going to be ready to go in June of this year. So we are on a very aggressive time line, but it's one that I think we can meet and we think it is a commitment we have to make to the community that voted for this project.

Q ----fine arts --- river . Untranscribable

A. No. The main river as it is today will stay there. It's just reopening and enhancing what the original channel was. It will be flowing from WestPlains Energy where there is already an average flow of 30 & 95 CFS. It's just piped right now; we're going to open it back up. Also, we filed for a junior water right, and we actually will build the project where it could be turned into a reservoir project just like they have done in San Antonio, where we could actually release transmountain water to the project and just have a substitute supply plan for any losses that are caused by the project.

Q.

A. It protects the project from anyone else filing on the water rights. It is a very junior water right and the augmentation plan will have to be the key or important part of that. So for the water that we need, it will have to come out of our current inventories. Actually, they're not large -- we're refining those now, and it looks like 35-40 acre-feet per year -- because there's really no consumptive use in the project other than evaporation. The total project will be lined, so whatever evaporation there is will be from any water fountains, water features and the open surfaces of the water.

Update on "Smart Growth"

Thomas A. Kourlis, Commissioner
Colorado Department of Agriculture

Let me talk a little bit about how I see the Arkansas River Basin and the issues that are facing it. Yes, the Kansas lawsuit has forced us to revisit the way we use water and because of that, I think we have to be attentive in trying to evaluate the future. That ties in pretty nicely to Smart Growth.

It is important to keep in mind how important agriculture is to this region, to the state, and more importantly, to the nation itself. I do believe that as we look at the importance of agriculture, at the trends of what is going on, and what's happening, that we need to talk about what direction are we going in, what are we trying to do, and what our visionis for 50 years from now. And then I think we have to look at it as a challenge for agriculture and how we play our role in that.

First, let me go back to some of the statistics and information for those of you who like numbers. I always liked numbers and numbers seem to never lie, but then I figured out it just depends on how you divide -- if you're a bad mathematician like myself you occasionally come up with the wrong numbers. First, there are 27,000 farms and ranches that own or manage half of Colorado's land. That isn't including public land. Farms and ranches produce $4.1 billion worth of crops and livestock each year in the State of Colorado. Agribusiness inputs and production and processing/marketing generate $13.6 billion per year.

Of the 21 pairs of nesting bald eagles in Colorado, 19 nest on private land. I bring that up because frequently what we do is make some assumptions about bald eagles -- that they're dependent on public land for survival -- but this is just an analogy. We make some assumptions and perceptions and we make decisions based on perceptions. And occasionally in government because we have these perceptions we move forward without having the proper vision.

I think this is important to tie that back to the Kansas lawsuit --we can't deal in perceptions. I think what Hal and David are trying to say about this is what is really important. This is what we're really facing. I think we have to look at that as a reality and if we can accept that reality, we can move forward.

Let me make one other analogy. Five years ago in the playoffs Denver's on their own four yard line with two minutes to go. John Elway comes to the huddle and says, "We've got them right where we want them, guys. We can do this." I don't know if you remember, but that really moved me, considering what they accomplished in point of fact after that. What they did is they accepted where they were. They accepted that they were on their own four yard line, and because of that, they developed a strategy in which they could go to their goal line. In doing that they made some plays, they made some decisions, they moved forward and they got there.

I think it's important to deal with the facts. And even though we feel sometimes as though we're on the four yard line, that's better than assuming that you're on the fifty rather than on your own four. So as we move forward in Colorado, I think we have to keep that in mind.

Let me give you some more regional statistics about agriculture and how important it is to this region of the Arkansas Valley. The Arkansas Valley is home to 20% of all of Colorado's farms and ranches, 21% of Colorado's cropland is in the Arkansas Valley, 13% of Colorado's irrigated land, and over $600 million per year is generated in crops and livestock sales. I heard a little bit earlier that there is $40 million dollars generated in recreation. Agriculture is doing $600 million in your community alone. That's something to keep in mind.

Let me talk about regional agribusiness highlights, about inputs, farm and ranch production, and value-added processing. Annual gross sales of $1.3 billion, which constitutes 10% of the state's total, comes from the Arkansas valley. Over $260 million in annual income, 11% of the states total, and over 10,000 regional jobs are generated in agribusiness, 12% of the state's total.

Let me talk a little bit about trends and the direction we are moving in the State of Colorado. Let me talk about it in the sense of land and water. Since 1978, Colorado has annually lost an average of 90,000 acres out of agricultural production. The Arkansas valley has lost an average of 36,000 agricultural acres per year. Statewide, we have lost 19,000 acres of irrigated land each year since 1978, and that figure in the Arkansas basin is 5,000 acres. From a peak of 3.4 million acres, statewide irrigated acreage has dropped 8% a year since 1978. The Ogallala aquifer now accounts for 20% of Colorado's irrigation base. So I think that creates a basis, a kind of a trend as to where we're going.

In our office at CDA, we have a multitude of responsibilities, from regulations to establishing policy, to making recommendations on state and federal legislation. You know what we all do once in awhile; we get so focused on one particular issue that we make that the world. We stay focused on that issue and we forget the rest of the story or the whole picture. That is important to keep in mind, because as growth continues I think these trends will continue. Colorado is a beautiful place -- it has aesthetics, it has a good economy right now; we've got to work on some things but this is a great place to live. This state's growth has been in the top three of the 50 states, three years in a row. It has the highest growth, the best economic prosperity, and this is a place people want to be. So what's our challenge?

I think our challenge is trying to say this is where we are, either at the four yard line or the 50, and this is where we want to go. I think if we can do that as a group and with a common voice, we can move forward. So I suggest to you that we will continue to lose some of our ag lands unless we work to change that trend. That's what Smart Growth was really intending to do as agriculture's part of the effort.

Let me talk about some of the consequences if these trends do continue. There will be fewer and fewer places to grow food. Right now it doesn't really matter; we grow more than we can produce and we export 20 some percent of our production. Let me give you one little thing that always keeps coming into mind about how important is agriculture. Obviously, if you're in agriculture it's very important, it's your livelihood. But, I think it's more than that. There are demographics that say if we continue going along this road that we are walking, we will consume all the agricultural food that we produce in this country by the year 2025. We will no longer be exporting food. And if we continue to grow in population, what's going to happen in the year 2050? You've heard the Governor say, "What is your vision, what do you want it to be like 50 years from now?" Fifty years from now is 2046? Well, someplace along that road, we're going to be faced with the public, the urban public, the people that do not live off the land and do not have the same information that ag producers have. They're going to have to recognize that there must be a change or all of a sudden, food gets to be important. A friend of mine always told me it was not how much food you have that really makes the difference, it's the lack of food that really makes the difference.

My intention is not to try to scare everybody and say we should be alarmed. I think we can avoid that. I think we can make it good for agriculture and the public in general by simply identifying it as a possibility and planning it out and making things not happen like demographers are projecting that could. As we continue to grow, I think agriculture will continue to lose land and water. I think it will get moved more and more to other uses. We looked at a wonderful proposal here by Pueblo. There will be more expectation for private use for citizens to utilize.

Let me go back and summarize what really Smart Growth is. The Governor started a year and a half ago and said we have to think about where we're going to effectively manage the state. Really, Smart Growth is just a vehicle to have people think about the future, about what they want it to be 50 years from now, about where they were going. It was to stimulate a grounds-up kind of approach, trying to solve a complex set of problems. The Governor realized that there were really some diverse concerns. Some people were saying, "We don't want to grow any more." Some people were saying, "We want to grow more." Some people were saying, "We want to use our resources for this activity, not that activity." In that whole process, and surprising to a lot of people, Smart Growth increased the visibility of agriculture. I think primarily that it was done because people started to recognize a lot of the values that they appreciate, and agriculture has provided for them a long time. A lot of the wildlife habitat that is provided in this country and in this state is provided by landowners, private landowners that are mostly in agriculture. It's very important to maintain that habitat so that there is a success to point to.

Agriculture not only provides those other amenities or needs or desires of the public, but it also creates jobs. It also pays

taxes. It provides open space without having tax dollars paid for it. It also represents something that people who move to Colorado truly enjoy. It's part of our culture that we can live in Denver, Colorado Springs, or in Pueblo, and in a few a short minutes be out in a place where it is open and we can try to imagine what it must have been like coming over in a covered wagon and looking at those mountains.

Let me talk a little bit now about what is going on now with the Smart Growth planning process out of the way. What is being accomplished? Like I said, I think Colorado will grow. The only question is how, in which direction, and how will it affect us? It could be a positive experience or it could be a negative experience.

The Governor appointed a group of people, 17 leaders of agriculture, local government, development and the environment, to try and wrestle with ag land questions and what we should do about it as we grow. That group came up with 22 recommendations (which are available to you in the back of the room)to preserve our ag land base and assure that there is some viability in agriculture. It is important to have viability in agriculture if you've got growth because if it is a viable business, the owner will be less willing to sell out and have it subdivided. But what we tried to do was focus on some voluntary, incentive based approaches, and I'm going to highlight some of them now.

First, one of the hot controversial issues was the 35-acre parcel question. A compromise position was struck by the ag community, the development community, and the natural resources community. And that was, let's go ahead and assume that there is going to be an opportunity for 35 acres and if you want to subdivide the 35 acres you have to do it in a safe way. It has to, for example, be safe to the person who is living there, have good water, and have the access for fire trucks to get there or emergency equipment to get there if somebody gets in trouble. If they met those standards, they would save the opportunity to go ahead and subdivide to the 35-acre density.

But a lot of people in the community may want to have 35-acre development done a different way to enhance wildlife migration, aesthetics. And so the compromise said okay, can go ahead and build the 35-acres, but if the community wants also to impose some other restrictions that benefit everyone, that they go ahead but create an incentive for that landowner to modify his subdivision. If he were to provide for wildlife migration or riparian preservation, maybe instead of getting one housing opportunity for 35 acres he would get 1 per 30 acres. That is just simply negotiable within the community.

Another recommendation by the ag land task force was the right to farm. In places where there's high growth and development, it's getting harder and harder to stay and farm. One of the biggest problems in this circumstance is the threat of nuisance lawsuits. A right to farm law would protect him when he's bailing his hay at 3:00 in the morning to catch the leaves. The neighbor that has built his house next to him can't shut him down because he doesn't like the noise. As long as it's a normal practice, it's a reasonable practice, it's an acceptable practice, it should be allowed. An example that I have specifically in mind happened north of Denver. A person was bailing his hay, a neighbor in a subdivision sues him for a nuisance, and he had to go to court to defend himself. It cost him $2,000 and a day in court. He won. Now all of sudden, the next time another neighbor does the same thing to this guy; the plan was they would rather not have the farmer bailing his hay in the morning.

What happened is he effectively said I can't do this. I mean, I'm farming land that is worth much more subdivided, so why am I fighting both sides of this coin? Maybe I should sell this out and go on. I think to keep agriculture in place you need the right farm opportunity and that's being entertained, as a matter of fact right now, for legislation this year.

Let me talk about the controversial enterprise zone issue. In the task force's view, that enterprise zone should be preserved in areas where it was necessary to creating incentives. Perhaps we have to restructure it a little bit. To me, I think we can use the enterprise zone to creative advantage. In my travels through the state, Lamar has said and Pueblo generally has said "We like growth, we need it, we want to diversify our economy. You go to Denver, Colorado and they say, "I don't want any more growth because I can't get to work any more. There are so many cars there that I can't get to work. So I really don't want any growth." The enterprise zone question, if it's revisited, has the possibility of redirecting growth. Although it's controversial, I think it has possibilities. Right now, for the economic condition that we're in, I think maybe it's used too broadly.

There has to be increased support and incentives to expand protection of soil and water, vegetation and wildlife on agriculture land. I think we have to do that in a way that will conserve resources so that 50 years from now I can know with some assurance that my kids have the things they need. That has to be expanded on, and we have to take some responsibility in the state maybe through some tax incentives or maybe even income tax.

We have to protect the water supplies. Let me tell you a story. About a year ago I went to a Cherry Creek grade school and spoke to about 300 4th and 5th graders. I asked what would they think is the most important use of water? Water that goes to food? Water that goes to personal use, like drinking water? Water that goes to recreation and water that is designed for minimum stream flow to protect endangered fish? Prioritize those for me. I actually even went on to try to make it a little funny and I said the water, by the way, is going to be used for broccoli. There were a lot of kids that said, "I don't like broccoli!" I asked them for their choices. Drinking water was first, water for food, second, recreation was third, tied closely to minimum stream flow. It surprised me, to be honest with you. These children, 4th and 5th graders, recognized the need to have that. Obviously, I'm sure they would want to have it all as we all do, but we have to develop ways to conserve water supplies and highly productive lands.

We have to entertain ways to fix some of the problems or create incentives on how we can stretch out water use. I don't know if it's even possible politically, but there isn't very much of an incentive right now for a farmer to be as efficient with his water as is technologically possible. If he gets too efficient, he loses his water. I think we have to address that and I think, as a matter of fact, the Inter-Regional Council, the Smart Growth advisory body, has made a recommendation that there be a task force to look at water issues and preserving water for irrigated agriculture.

One thing to consider is what we should so that if someone conserves and develops practices like a lot of these conservation systems that are out here that he also doesn't run the risk of losing his water. It's like saying, "Hey, spend a hundred thousand on new technology and if you get that, we're going to take away your water rights." I think a blue ribbon task force to try to resolve that is a good idea. That's another thing that's on the table.

Last, there is the desire to expend GoCo funds, or through a tax base like they do in Boulder County with a sales tax, to purchase development rights. It's actually a nice compromise if you think about it. What you do is you say to somebody, if you'll keep this land, this highly productive land in agriculture production, we'll compensate you for the value it would be worth as a subdivision and we'll put that in the deed restriction so that's the way that will stay. And so what you will have is agriculture, you'll have some generating economy, you will also have the open space and all the peripheral benefits from agriculture, but you won't have the development. And I think that is an opportunity.

There's a new other way to compensate landowners for development potential without subdividing their farms, and that is to transfer development rights. Let's imagine a community where on this side, everybody agrees development should be directed, and on the other side, it shouldn't be. How do you treat everyone fairly if you all are individual owners, for example of the chairs in which you sit? If this person right here wants to build on his chair, he has to go and purchase a development right, for whatever the negotiated price is. But once you sell your purchase right to him, he can build and that seat stays vacant. And so what you have is a way of getting around using tax dollars. You can almost balance it out so you have a long-term opportunity of directing the land use.

Q. Untranscribable.

A. I don't think you will address odor. I'm not familiar enough with the bill, but I don't think it does that. Just because you move next to a feed lot, can you shut down that feed lot? I would say no. But if you move next to a farm that's been a corn field and it gets turned into a feed lot, I would say that would not apply.

Great Plains Reservoirs State Park

Ronald P. Desilet, Southeast Region Manager
Colorado Division of Wildlife

Before I get started, I will use my posters to orient you to the area that we will be talking about. The area that we will be discussing is the Great Plains State Park located in this series of lakes. This is the town of Lamar and this is the John Martin Reservoir. This is the Ft. Lyon Canal and Kickingbird Canal. This is the area we're talking about. In particular, we will be talking about the Great Plains Reservoirs. The gray area is basically the high water line of the dead pool storage at all four of the reservoirs. The dark area is the operational level that they have historically used at the reservoirs.

The Great Plains Reservoir project was developed as a product of an implementation plan which was prepared by the Lower Arkansas River Commission in 1993. For those of you who are not familiar, the Lower Arkansas River Commission, or LARC as it was called, was established by Governor Romer by executive order in May of 1992. One mandate of that executive order was to develop an implementation plan that would stabilize the fish and wildlife values of the Great Plains Reservoir and establish a water-based state park in southeast Colorado. Currently no state park exists south of I70, east of I25 in the southeast part of the state. There is one exception to that and that is Rocksborough State Park which is southeast of Denver.

The Great Plains Reservoir project is a complex consisting of four lakes. These were modified to accommodate irrigation needs of the Amity Irrigation Company. The total storage capacity of the complex is about 264,00 acre-feet (af), of which 87,000 af is unavailable or dead pool storage. A combination of the storage complex and the direct flow right provides water rights to irrigate approximately 34,000 acres by about 250 irrigators. The lake complex is charged almost exclusively by water from the Arkansas River through about 76 miles of canals. The first 40 miles is owned and operated by the Ft. Lyon Canal Company, the remainder is owned by the Amity Irrigation Company. The lakes lie in the extreme southern portion of Kiowa County although a lot of the benefits, economic benefits, accrue to Prowers County. Additionally, local residents from these counties and four other surrounding counties as well as non-resident recreation from Kansas support development of a park in this area because of its short commuting distance to their homes. Currently hunting and fishing in the six-county area serviced by the complex generates approximately $26 million in annual revenue.

With the implementation of the LARC plan an additional 200,000 visitor days are expected in this area annually. Wildlife species, which Jennifer will cover in more detail later, that inhabit this complex include warm water fish species, water fowl, mule and white-tail deer, numerous shore birds including the two T&E species and a multitude of neo-tropical birds, and numerous small mammals. The implementation plan developed by the Lower Arkansas River Commission recognizes the value of the lake complex to the local economy as well as the wildlife values of the complex to the State of Colorado.

At the same time, the commission also recognizes the need to maintain and develop these values without placing undue hardship on other interests in the Arkansas River. In this respect the commission applied caveats to the implementation plan that would protect these interests and other interests to the extent possible. Among these caveats, which I would like to go into in a little more detail, is included the need to maintain water for agriculture. That was a key point in establishing this implementation plan. This caveat limits acquisition activity to those purchases that would not significantly impact the agricultural economy of a specific area. In this respect, our acquisition goals are to acquire only sufficient water to replace the annual evaporation against the dead pool space. This would take approximately 8,000 acres out of production. We feel that if we target marginal land, any impact to the local economy by the loss of agriculture commodities would be offset by increased economic benefits generated by recreation. The county commissioners in the impacted counties would provide oversight for this activity. They would have to approve any acquisitions that we would pursue.

The second caveat deals with avoiding injury to vested water rights. This caveat mandates that we proceed in a manner

that will not injure other water users on the river. Inherent in this caveat is the need to consider return flow requirements, state line flows and historic diversions to the complex as well as historic evaporation from operation of the complex. To satisfy this caveat, our proposal envisions improvements to the conveyance system and a modification of how water is delivered to the irrigator. There should be a net reduction in surface area under our proposal with a resulting reduction in evaporation losses. The diversions to the complex would only occur in priority, and no expansion of the water right is anticipated or envisioned.

A third caveat deals with minimizing the need for extended litigation. This caveat mandates that our proposal be structured in such a manner that other water users on the river do not have to become involved in extended litigation to protect their water rights. In this respect, our proposal reflects an operation involving only the Amity Irrigation Company operating in a manner that mirrors their utilization of a storage right over the hundred-year existence that they have operated this system. The only modification to their historic operation is the assessment of responsibility for replacement of annual evaporation against the dead pool. Historically, this obligation was shared on a pro-rata basis among all shareholders. Under our proposal this obligation would be assessed only against those shares owned by the state. The state in turn would not irrigate those lands acquired under this proposal. Currently, the Division of Wildlife is considering all options for operation of the complex that do not violate any of these mandates expressed in the implementation plan.

Unfortunately, no option is without risk. Generally speaking, all risk is compounded by the complexity of interests you will find along the Arkansas River. This project alone requires the consensus and a lot of direct involvement by at least two irrigation companies, six counties, the federal government, the Arkansas River Compact administration, litigants in the Kansas/Colorado lawsuit, four state agencies, the state legislature, and no less than 250 Amity share holders who have to ratify any proposal we go forward with to operate this proposal. Overwhelming? It seemed so at the outset. However, given the level of cooperation we have experienced to date, I'm of the firm belief that sufficient interest, technology and administrative know-how exists to overcome any obstacles to successfully implementing the proposal.

Wildlife values associated with the Great Plains Reservoirs have existed there for over 100 years. When it was realized that a change in operation of the complex resulted in the loss of something of value, an effort was put forth to reverse that negative situation. This indicates to me the people do recognize and appreciate the need to maintain stability and the quality of life they had frequently taken for granted. It also indicates that regardless of their specific interests they will do what they must to ensure that their quality of life is not jeopardized. The responsibility, I believe, of state, federal and local governments is to provide the expertise and effort for financial assistance where available to ensure that these fish and wildlife resources and recreational amenities are available to sustain their quality of life.

Cooperation Among Public And Private Landowners For Wildlife Habitat Preservation

Thomas Quinn
Sierra Club Attorney

I'm supposed to be speaking on cooperation among public and private landowners for wildlife habitat preservation. I prepared something to say tonight and then I walked in the room and got an earful from a private landowner which has changed my perspective a little bit. Anyway, my comments tonight are going to focus on my own experience in observing and working on the issue of the Centennial Wildlife Refuge on the South Platte. And in particular I will discuss the problems that arose with that proposal and the solution that came about. I think that what happened in that situation may provide some lessons for what's going on the Arkansas and may be useful to you.

I should briefly mention up front something about the Sierra Club's wildlife policy. There is a little confusion about what the Sierra Club is about. The cornerstone of the Sierra Club's wildlife policy is protection of natural ecosystems, and that has always been central to our wildlife policy and to our policy of encouraging protection of wildlife habitat. However, it is important to point out that does not in all cases mean public acquisition of wildlife habitat areas. Nor does it mean that we want to go about trampling on private property rights or anything of that sort. The problem is how to go about protecting natural ecosystems in a way that does not unnecessarily trample on private property rights. And as we all know, that is a problem causing a lot of conflicts right now not just in this area but in many areas of the West. While there are frequently situations where the Sierra Club does support public acquisition of land, there are also many situations in which we actively encourage public lands managers to work with private land owners to protect wildlife habitat while at the same time respecting the private property rights. From the point of view of protecting natural ecosystems, the Sierra Club does believe that it is very important to work with local land owners and private property interests including agricultural interests in protecting wildlife habitat. And as we will see, there are a couple of good examples of how that can be done by public land managers and private land owners working together.

It is important to point out from the point of view of protecting wildlife habitat that the Sierra Club has a strong preference for seeing those beautiful ranches and open fields and wide open vistas that I noticed on the way between Colorado Springs and Pueblo. I don't come down here very often and I was stunned on the drive again, because I had completely forgotten how beautiful it was. Those types of scenes with the ranch houses and cows and horses are 100% preferable to some of the scenes we're seeing, particularly around the Denver area now, with condominiums and development that is just on a scale that you can't comprehend when you come down to this area. So from there I'm going to jump into the example of Centennial Wildlife Refuge.

Many of you are probably not familiar with that wildlife refuge proposal on the South Platte. In the summer of 1993 the U.S. Fish and Wildlife Service proposed to purchase about 15,000 acres of land straddling the South Platte River and Morgan County between the Empire and Jackson Reservoirs. It encompassed about 5 miles of the river. The land in question was considered to be high-quality wildlife habitat and had been originally looked at by the Fish and Wildlife Service back in the '70s as part of its strategic planning process. The concept of creating a refuge in that area resurfaced in the 1980s, and eventually a public proposal was made in 1993. Now, the response by local land owners and other interested parties in that area was, as you can anticipate, very mixed. Two local landowners who had large holdings in that area wanted to sell and stepped forward and indicated their willingness to sell to the Fish and Wildlife Service. However, there were a number of local interests that raised some objections immediately to the possibility of a federal wildlife refuge. Those concerns, not surprisingly, included general concerns over loss of private property rights in the area, fear of the federal government, decrease in property tax base in the area, impacts on predator control, concerns over loss of agricultural values, and water rights issues, of course. To deal with those problems, the Fish and Wildlife Service established a task force to look at the issues that had been raised and try to develop a solution that would take into consideration everyone's interests and still bring about the protection of the wildlife habitat. The task force included people from the Fish and Wildlife Service, the Colorado Wildlife Federation, the Division of Wildlife, and a number of local interests including water conservation districts and the Farm Bureau.

Several issues arose in the task force process. Since this is a conference on water, I'll talk about water here. First, local

land owners and agricultural interests were concerned about possible assertion of federal reserved water rights in the area. Now, most of you know that this issue has arisen primarily with regard to federal wilderness areas, Indian reservations and wildlife refuges. Although there was no indication that water rights were an issue, because it was not reserved federal public domain land, that was nevertheless an issue which was raised by local interests. There was also an issue as to whether or not the wildlife habitat in that area could be sustained if irrigation and water diversion activities were eliminated. This is always an issue that comes up in a situation when you have essentially man-made wildlife habitat that has been created by irrigation or water diversion. The forest, the beautiful forest in the riparian corridor in this area 5 miles along the river is just magnificent, but historically most of it was not there. And I imagine that there are probably some areas on the Arkansas that are essentially the same situation. So if you were to somehow take the irrigation activities out, there is a question as to whether you would have that same habitat. So, anyway that was another concern that was raised. One of the solutions to that problem was to require that the water rights remain with the land for conservation. That was one of the solutions that came up. There were local water interests who were opposed to the refuge because of the belief that it was an attempt at a federal water rights grab to protect endangered species downriver in Nebraska. That was not the central purpose of the proposal. Naturally, there could be some secondary benefit from having some additional water to send down the river but that was not what the proposal was about. Nevertheless, that was another local concern that was raised. Additionally, there were a lot of hazy "what if" questions about how laws such as the Clean Water Act and the Endangered Species Act might restrict land owner rights if the refuge was established. Again, none of these issues were easy to overcome. Some of them were quite valid because there were a number of farming and ranching operations in the area that were water-dependent. The task force looked at a number of options for preserving the wildlife habitat. What was generally agreed early on was that most of the local interests did not want a wildlife refuge in the area.

Now in the meantime, as other players stepped in, the Colorado Division of Wildlife indicated some interest in purchasing those two large parcels of land which made up about 2,000 acres. The other more interesting idea from the prospective of what I'm talking about was the task force decided to look into establishing a land trust to protect the wildlife habitat. It would be administered by the local landowners working with national land trusts like the nature conservation or the American farmland trust. The task force looked at some other situations where land trusts had been used successfully to protect wildlife habitat and agricultural activity. Particularly they looked at the example that is going on in Steamboat Springs now, where some of the local ranchers decided that they wanted to protect their ranching way of life and the scenic vistas in that area. And working through the farmland trust and the nature conservation they were able to secure conservation easements on large parcels of land around Steamboat Springs. Of course that situation is a little bit different because you have resort property in those areas going for something in the range of $10,000 an acre. But, nevertheless, it has been successful. They have been able to convince several land owners to get involved in that. Based upon this example, and other information, the task force decided to make a dual proposal. First, they voted to encourage the Division of Wildlife to purchase the two large parcels and have some area with public access. Second, the task force supported the formation of a land trust on the remaining 13,000 acres or some part of that area. The Fish and Wildlife Service agreed that upon successful formation of that land trust, the proposal for a wildlife refuge would essentially go away. Now the proposal that the task force came up with, particularly the land trust part of it, solved some of those problems that I just talked about a minute ago. First of all, most of the land would remain in private ownership under conservation easements which would protect the wildlife habitat while allowing agricultural activities to go on with some restrictions. The property tax base would not be seriously decreased because the land would remain largely in private hands, water rights would remain on the land and be used for agriculture, and wildlife and the general concerns about federal land ownership would also essentially be eliminated.

The Sierra Club had been involved up to that point more or less by writing letters to the Fish and Wildlife Service encouraging them to establish a refuge. But what we also decided to do, and I think this is a good example for other environmental groups, is that we went out and we met with local people in the area to see what they wanted to do. And, we actually found that we had a lot in common. We all wanted to preserve the wildlife habitat and we wanted to help them be able to do that by being able to continue with their agricultural operations in that area. We all left the meeting with the feeling that we had something in common and something that we could agree on. And then the Sierra Club did formally endorse the concept of a land trust.

Now, where has all this gone? This has all been happening more or less over the last year and a half. The Division of Wildlife proposal, some of you might know, is somewhat in a state of limbo right now; however, the task force has actually moved to establish a land trust. And if anyone in this room is interested in talking about land trusts, this is potentially a model for how it could be done. They've actually drafted their bylaws and articles of incorporation and formed a board of directors and started meeting to figure out how they're going to acquire conservation easements. While the jury is still out on how that's going to work out, I think it provides a good model for something that could be duplicated in other areas including down here on the Arkansas. Conservation easements are basically established in a written document which allows the landowner to retain ownership of his land but disposes of all or some of his rights to develop or extract natural resources. It consists of the right in the owner of the easement to prohibit or require a limitation in part or obligation to perform acts with respect to a land or water area, appropriate to maintaining the land predominantly in a natural, scenic or open condition or for wildlife habitat.

The statute also mentions agricultural activities, so if you wanted to form a land trust just to protect the agricultural vistas, the open fields and all that sort of thing, that is within the definition of a conservation purpose. Other features of a conservation easement include that you have to have a conveying document, it has to be a written document which states the characteristics of the easement including the rights that are relinquished and the restrictions that are placed on use of the land. Obviously, you are going to have some kind of restrictions on what can be done. It has to serve a conservation purpose, and again that is pretty broadly defined. The easement can only be granted to a government entity or tax-exempt organization that was organized at least two years before receipt of the easement.

Now, there are some interesting features about conservation easements. First of all, property tax issues which come up frequently, concerns about local loss of local property tax base. Effective in the 1995 legislative session we have a new law, House Bill 1268, which allows for agricultural land to retain its agriculture classification for property tax purposes when a conservation easement is given instead of being reclassified as vacant land. So, in other words, it stays agricultural so that taxes don't go so high that the land owner can't afford to maintain the land. Secondly, ordinary agricultural use of the land can continue, but that's something that has to be stated in the easement document. If there are existing farming or ranching operations, ordinarily those can continue to go on with some restrictions. The water issue: the statute specifically provides for conservation easements covering water areas and water rights owned by a grant for an easement. So it doesn't just cover land, it also covers water. But the statute also says that no transfer of water rights or change in point of diversion can be impaired or adversely affected by a conservation easement.

The other interesting thing about conservation easements is potential income tax advantages. If properly done, creation of a conservation easement can have tax benefits to the grantor. Now, it's probably no shock that there are already conservation easements being created out there, and the Division of Wildlife in fact specifically indicates in its long-range plan that conservation easements are one of the tools that they are going to be using more in wildlife habitat protection. I think the important thing about conservation easements is that they are another tool for protecting habitat, a tool that allows agricultural activities to continue on site in most situations while at the same time protecting the habitat and preventing it hopefully from turning into a forest of condos. It may not seem like a relevant issue now, but if I was struck by what I saw driving between Colorado Springs and Pueblo this afternoon, and a lot of other people are going to be struck by it eventually. The estimate on how long it would take development to hit the area of the South Platte I was talking about was about 20 years. We're probably talking about something like that here too before our neighbors to the far West discover this place and want to start building upscale homes. So anyway, it's a time to start looking at how to protect agricultural heritage, how to protect the wild habitat down here, and I think I've provided a couple of examples for how that can be done.

In conclusion, I think there are many opportunities for public and private land owners to work together to protect wildlife habitat. I've outlined a couple of solutions. If anybody is interested in getting more information on conservation easements, there's an excellent article in the High Country News that I can supply to you that will give you more information. I think the important factor is that all parties need to work together, the kind of cooperation that Ron was talking about awhile ago. There are some problems, some of which I hadn't really thought about until tonight, particularly between the Division of Wildlife and some local land owners, but I think the key, and we saw that with the South Platte situation, is that if you get people together to talk about a problem they will usually find that they've got

common ground. It's always critical to understand that other people have problems too. Private landowners have problems. Public land managers have problems. And when you get together and talk about those you can find a solution to the problems.

Environmentally Sound Agricultural Practices

Kirk Hanna, First Vice President
Colorado Cattlemen's Association

It doesn't take much of an imagination to realize resource managers have an ominous responsibility. We, 2% of the population, are expected to produce a safe food supply while protecting the health of resources. If we fail to meet either of these demands society (98%) will quickly limit our ability to manage. This threat alone should encourage all resource managers to monitor practices for effectiveness, and document improvements.

Resource managers are given an opportunity to conduct a symphony of natural components. In my case, this honor was not earned by any in-depth knowledge of those components; it was because I desired to accept the responsibility for a family property. The assumption we began with was that the more closely we can simulate nature the more sustainable our practices will be.

Our shift in management began when we realized that management was the culprit limiting our potential. We reasoned that continuous grazing was keeping us from achieving a more diverse plant community. We took a refresher course in grazing techniques and sat down with consultants to design a new approach. Beginning with four major subdivisions or pastures we planned to increase production. We took on our neighbors 150 cows at $10.00 per month for 6 months. This generated $9,000.00 additional revenue year one. With this revenue we began construction of electric cross fencing and water development. As the years passed we evolved to a 35 pasture design. This gave us much more management flexibility and control. We can now more closely control length of grazing and rest periods. We can better utilize animals to create the desired landscape condition.

There continue to be challenges that require we adapt our management. No matter how well a land manager does with his tract, landscape health does not exist in a vacuum. The nature of the Arkansas river and its tributaries is such that water quality, velocity, and volume can best be improved by a whole watershed approach. All components of this watershed are at risk if whole watershed needs are not identified and addressed. For example, treating noxious weeds downstream is futile if not treated upstream. Streambank erosion on the main river will continue if no effort is made to deal with the energy of the tributaries. Water quality improvement will be elusive if all dischargers and nonpoint sources don't participate.

I thank you organizers of this forum for allowing our participation. We look forward to hearing how we can improve our management and benefit the watershed.

Wildlife and Water Along The Lower Arkansas River

Jennifer Slater, Wildlife Biologist
Colorado Division of Wildlife

While Ron Desilet started with a governmental scope of things, most of what I do is actually on the ground level scope of things. The policy makers make the policies and we out there have to learn to live with them. Sometimes that's quite challenging, as it was this past summer. There are a lot of policy makers out there so there are a lot of different policies to deal with.

I'd like to pick up on Kirk Hanna's idea with the scope of the time period that we're looking at here. Some of the water issues that we're working with on the lower Arkansas valley are now 100 year-old water issues going back to when some of these canal systems and reservoirs were first developed. Probably before that there was water out there; I'm sure there was. There were playas and the river was still there, so wildlife probably used it much as it does today, but all the wildlife has had to adapt somewhat to the things that man has done. I think we have to help wildlife adapt along with us and keep them out there.

In 15 minutes I could not even remotely touch on all the species of wildlife even in the lower Arkansas river valley. I will focus on least terns and piping plovers, primarily because they're so important nationally. Least terns are considered an endangered species on the federal list. Piping plovers are threatened, and when we talk about T&E species that's what we mean--threatened and endangered. Probably the reason that we know so much about them is because they are threatened and endangered and we have to focus on them because if we don't we'll lose them. But a lot of the other species of wildlife that we have on the Arkansas, especially in a year like this last summer, were probably all effected one way or another by water regimes and what we've done. So with that, I'll go through some of the things that we had to do this summer to try to help the least terns and piping plovers. And as I'm using them as an example, you can expand your mind out into all the wildlife species and realize that all of them were probably somehow affected either positively or negatively by water levels that we had this last summer. I think you'll kind of get a feel for what happens out there in the country.

Nationwide, there are probably about 2,000 pairs of least terns on the interior continent. The coastal areas have more, and piping plovers are probably in the 1,500 range. Now, the reason that the least tern has more birds but is more endangered, I think, has more to do with their kind of nesting regime than anything else. But there could possibly be, here in the next year or so, piping plovers being moved to the endangered species list depending on what happens in Congress this year. This is the least tern and it's not leased; we don't rent them from anybody. This is least and it's the smallest tern. They are a delicate tern. Terns look a lot like gulls when they're flying; they have long pointed wings. This one has a black cap. A lot of times in the summer you will see them carrying around small, minnow-sized fish. And this is a least tern nest. It's not really typical, in that there is a lot more vegetation around this nest now than when the nest started. When this bird started the nest this was a completely bare sand beach. This happens to be on the island in Adobe Creek Reservoir. And you're going to say that this looks a lot like the piping plover nest that I'm going to show you in a moment.

This is a piping plover. They're a lot like the killdeer in size; perhaps a little smaller than the killdeer actually. They are hard to see on the beaches because they blend in so well with sand. They have a sweet, melodic kind of call that they make and many times it's hard to tell where it's coming from and it is hard to pinpoint where the bird is. And this is a piping plover nest. Often, the way to tell the difference is how many eggs are in it, only in this instance it really doesn't help because this time the piping plover had two eggs in it and the least tern had four. So, it's usually reversed from that. But you can see they nest in exactly the same kind of spots.

Least terns will actually defend their nests. They have an endearing quality; when you're around any of their nests they will fly over you and, remember that cow pie that Kirk showed? Well, they have their own method of trying to keep you away from their nest and they will deposit tern droppings on you head. And usually they're quite accurate. The advantage to piping plovers nesting with terns is that piping plovers are very docile and won't defend their nests whatsoever, except they do a little broken wing display. I don't know if you've ever seen it with killdeer where they try

to lure the predator away by thinking that they're injured. So, if the piping plover nests with the least tern they get the benefit of the least tern pooping on people and actually they don't have to do as much work that way.

Both of these species need water. With the least tern most of their food comes from water, in that they eat fish. Piping plovers nest by the water; they're a wading bird, a shore bird, and they eat those small, annoying sand flies that gather at the edge between the water and the sand. We need water, but sometimes we don't need it quite as voluminously as we have had it this past summer,. Other hazards to the terns and plovers are the tremendous storms that we get on the prairies. This year we had several nests destroyed from hail, and some adults too. It even killed some gulls. And then of course, we humans too are part of the problem. These little birds love the beaches. Well, if we're going water skiing or camping or fishing or building sand castles, we love the water too and it's usually right in the same kind of beach that they like.

In past years we've tried to be flexible as far as letting the birds show us where they want to do their nesting, and then we go in and close the beach accordingly. This year it was hard because we were having to move closures because the water was coming up and birds were moving nests and we were moving nests for the birds and a lot of different things like that. If we can, the best thing to do ideally is to have habitat at all different levels of the reservoir, all the way from when it's at zero-pool, like Ron was talking about, up to high water levels. Now sometimes that's not practical, and so the birds just have to nest wherever they can find something, but we will use any kind of help that we can keep focused long enough on clearing beaches because what they like best is bare sand.

This happened to be a combination Boy Scout and 4-H group from the Las Animas area. If any of you ever have the opportunity to work with children, I'm sure some of you have kids and grandkids, sometimes it's hard to keep them focused on one activity, even though it is half-way destructive, for more than an hour at a time. But they can be pretty good help and you know they have a lot of fun at it too.

This year our challenge was to make useable piping plover habitat, in particular out of material that is not piping plover habitat. You can see that this is quite a grade. There are cobble rocks here, most of them bigger than your fist and some of them as big as volleyballs. This is not typical piping plover habitat, but this is where we had to move the birds up into on John Martin Reservoir. And then when we could get to where we thought it was high enough and make a sandy area, we were hoping that they might be able to pull off a nest in these kind of areas. But, we were dealing with water rising as much as a foot a day in John Martin Reservoir, which is a substantial amount of water, somewhere in the neighborhood of 9,000-10,000 acre-feet a day. In all the places across the whole country where people were moving least terns and piping plovers nests before, mostly piping plover, no one ever had to move them as far or as fast as we did.

We learned a lot about moving piping plover nests this year, even though we weren't successful in bringing off any young piping plovers. First we took the sand, including the pebbles and everything, and tried to exactly simulate the nests with a 16mm film can. Then all we had to do was move the film can instead of trying to rebuild the nest every time. This sped up our operation greatly and we could move a nest in less than a minute and have the adult bird back on it in about two minutes tops, which is really a critical thing when the sand out there in the sunshine can be 120 degrees or so. Birds are over their eggs as much to shade them from the sun and heat as they are to actually incubate them.

The other problem here is, one day we looked back at the beach and thought there was a giant tortoise or something following us down at John Martin by the way we had to move it. You can see each of these successive locations with the nests and where we had dug out the circle for the film canister. The problem is that anything -- a coyote, a raccoon, or a fox -- will come across this beach and it looks like there's something in each one of these circles and just follow it up from the reservoir. In fact, that's what happened with one of our nests. But, as much as possible, this was in a very hard, almost sandstone-like surface and there wasn't a lot we could do about trying to cover our tracks. You can see that we moved it probably 30 feet from where I'm standing taking the picture back to the water. In most places where they've moved piping plovers they don't want to move the nests any further than 8 feet a day, and sometimes we were moving them 8 feet every 45 minutes. Still, as long as the adult bird could see where we took it, they would come back to the nest. We were very encouraged by that.

This was a little bit different situation, another piping plover nest. You can see where we went, but it was easier over here to rake the sand and as soon as the sand dried out it looked a lot more like the rest of the beach and you couldn't exactly follow our tracks. Unfortunately as the water level comes up and the water comes up into vegetation it narrows the sandy beach area so much that one raccoon can cover miles of beach in a night and destroy quite a number of eggs, because it's not having to go back and forth across as much as a quarter of mile of sand. It has just a 50-yard strip, and can motor down and find every nest that it possibly can find. This was the nest that got eaten by raccoons, you can see just to the right of the tape measure is the actual nest cup. From the tape measure at about 11 o'clock and 7 o'clock you can see the racoon tracks. One is right here and one is right here and those are the back feet. I can't really see at this angle, but the front feet were over in this area and it just sat there and ate the eggs out of the nest. This one was within two days of hatching, so we were really disappointed.

This little bird we had a lot of trouble moving. Between late in the afternoon when we started until the next morning, the original nest site was about 3 feet under water out in here. The little bird in the nest is right here. That's the bird sitting on the nest and we had to move it very quickly up this cobble stuff and we finally decided that the best thing to do was to take sand, you can see some of it over here, and just start up the cobble with it because what was happening was that every time we reset the nest we couldn't find it because we couldn't see over the boulders and stuff.

When you're only a 5-inch bird, a six-inch rock is a whole lot more than you can see over, so this was a real challenge. This particular nest was destroyed by about tennis ball-size hail. As depressing as all that sounds, the kind of summer we had trying to chase around after piping plovers, we're hoping that there is a pot of gold at the end of this rainbow and that between cooperating with the irrigators and the irrigation companies, the Corps of Engineers, and all the other entities that Ron talked to you about that we need to coordinate with, we're hoping that we do a lot for all species of wildlife. This summer was just as hard on every other shore bird that was out there. Fish even had trouble. They also lay their nests in the rocks, and when they have to be in a certain depth of water with a certain water temperature and when the water is going up more than a foot a day, they don't bring off any young either. So, we need to all work together to try to moderate things as much as we can, and I know it's really tough in years like last when we had so much water, but that's where we're trying to get all the agreements in order so that we can kind of have the water and the birds in the place where we can manage it the best.

Presentations on Thursday
January 4, 1996

The New Congress and Impacts on The Arkansas River

The Honorable Don Ament
Colorado Senator, District One

Thank you. You all are very kind so early in the morning and thank you for the plug. This is what happens when "term limits" gets hold of you, and I say that in jest because really that's not true. I want to go to Washington, D.C. for a very specific reason, and that's because I think we need somebody in Washington, D.C. that makes a payroll, that borrows money, that uses water, that pays insurance premiums and lives with the people. And so certainly that's a motivation. So let me say to you that have taken time out of your schedule to be here this morning, I appreciate it. And I'm most happy to fill in for Congressman Hefley. I think they have a big job in Washington, D.C. and Richard wants to make sure he votes on the right side and I hope we all in this room agree what the right side is, but it certainly is being a hotly debated topic and it's very important to our future.

Let me get right down to the point. I'm very much concerned about the things we in the United States take for granted. And certainly the reason you're here, I would imagine, is because you're wondering about what we are going to do in the world of water. Certainly water is one of those things that is part of agriculture, part of freedom, part of all the basic kinds of things that have made this country great and established our quality of life and our standard of living. In my view, the public just takes those things for granted. I was alarmed, in fact I was taken back, when I was up at Northern for W.D. Farr's retirement celebration when you listen to the development big of the Big Thompson project and all the things that came because of the development of that water. Or, we could take a look in the southeast corner at what went on the Arkansas River. We could also take a look at what happened with the Aspinall project. What I'm trying to say to the people that I come in contact with today is look what those pioneering fathers did. They didn't have any electronic tools that we have to project what kind of population growth we're going to have; they had none of the tools to predict the weather pattern that we have today; but yet they were smart enough and had enough faith in what was going happen to put in place those projects. Those projects are what our quality of life today is built on. Do people understand that?

If you take a look at the people that are migrating into this state and what is happening down this Front Range corridor it is amazing. Do the public policy makers today have the foresight that those pioneering fathers had? I don't think so. It can't be encouraging for you to sit there and remember that the Bureau of Reclamation doesn't even want a dam on their logo anymore. They don't want to be associated with storing water and building water projects. They want efficiency, Sometimes I kid the Denver Water Board. Their solution to our problem and conservation of waters is a brick in a toilet. What do you think a Farr or an Aspinall would have thought of that idea back then? If that's what they had done back then, you can believe we wouldn't be farming and ranching today. We wouldn't be a world of plenty when it comes to agriculture. and protecting growth along this Front Range. Not at all.

We have to get people back to thinking about what are we going to do for our future. How are we going to sustain this quality of life? And you're the prime example. You know, I just can't believe what is going on in the Arkansas River. I think anybody that thinks they're free of this discussion that's going on here, whether it's those of us on the South Platte or the Rio Grande or the Colorado River, better wake up and smell the coffee. Who wants water now? Our new uninvited partners, the federal government. And as Elizabeth Estill told me one day at one of our own Senate Agriculture and Natural Resource hearings, "You're living in the past. The people that are in this state today and in this nation today want different things." I was really taken back, because the different things they want are your water and my water. Your land and my land. And did they help improve the land or develop the water? What part did they play in all of this? Do they want to help pay? Not on your life. I guess they think they have a God-given right to share in this with us.

And we see it every place. We see it when they demand bike paths or release flows from the Glen Canyon Dam. We see it when the Endangered Species Act calls for water to go right out of the State of Colorado. We see it on recovery programs. We see it in a hundred different places. People want our water, and it's being evidenced by the federal government right now under the Endangered Species Act, the Clean Water Act, the Safe Drinking Water Act, or in a whole host of ways in which they quietly come around and say they want a share in this water. Now there are

constitutional rights that guarantee us the protection of our property, but if you can't afford enough lawyers and enough expert witnesses do you really have constitutional rights?

I don't mean to be quite that negative but I have to tell you I got myself appointed to the CU Natural Resources Law Center Board because I just wanted to be a little token farmer up there with those lawyers to keep pointing that out. And I'll tell you I've come close to getting run out of Boulder a few times. But the fact of the matter is, people have to think through this issue about who developed that water, who put it to beneficial use, who used the resource. Just tell me who put the water to use in Colorado. It's just like the little red hen; now everybody wants to share in it and I'm very much worried about how the federal government wants to share in it. Of course, you see those things and you will see more of them as you live and work on the Arkansas River.

The bypass flow issue. You think that's gone? Not at all. We thought we had some kind of agreement worked out with the Forest Service up there with Ft. Collins, Greeley, Loveland and so on with bypass flows and special use permits, only to find Trout Unlimited sues the forest service over the agreement that we reached. So we will litigate the whole issue of special use permits again and I don't even know at this point in time, maybe some of you do, whether that suit's going to take place in Washington, D.C. or here in Colorado. The fact of the matter is we will spend a great deal of money litigating water rights with the policies of the United States Government, in particular, Forest Service, the Department of Agriculture and the Department of Interior. The big issue is about how the federal government wants to be involved in our water. There are over 800 special-use permits in the State of Colorado. Pueblo is coming up; I don't know whether this year or next year. But I'm telling you that we're going to have to litigate an issue on how we handle special use permits right down here in your area.

Who else wants water? Marian Law was just telling me the state engineer from Nebraska called her and wanted to talk about what's going on the South Platte River, so my neighbors in the Senate District that I represent up in the Northeast better get prepared, because we all know they're watching what's going on down here. They're going to take a look at the groundwater appropriators of South Platte and see what they think of our plan. They come up the river every year with a busload of people and take a look at what's going on the South Platte River, and as you're all aware, we're already in a meeting with the three states. Wyoming, Nebraska and Colorado and of course, the Department of Interior, to decide what we're going to do on the South Platte River and it would amaze you. The bureaucrats from Washington sit right down there and say, "Colorado, I think you owe us 25,000 af; Wyoming, you owe us 33,000 af; and Nebraska, you're going to store this in Lake McConaughy and you're going to do this, that and the other thing. This is some person that doesn't even know where water comes from, other than it starts out white in some high-altitude mountain. That's what we're facing. And these people think they have a mandate; they have a mandate to make sure we use water in different ways. Not ever being part of putting water to beneficial use, the federal government and a population that has no grounding or roots in Colorado and the West has made water a part of the war on the West. And don't even think it isn't true.

Downstream states will continue, with the help of the federal government, to look for more of our water. How many of you have been in Las Vegas lately? Let me see a show of hands. Have you ever seen how they use that water there? Man alive. Is that ever something. And you know what? They don't have enough of it. Isn't that amazing? And they want more. And guess where they want to come and get it. And do you know something? They're willing to buy it; they have the money to come and get it. They have all kinds of schemes. You ought to read the book on the craziest ideas they have planned to get water in the Vegas area. At one time it even included the old outdated single-hulled oil tankers shipping it down there from the Columbia River. They have money and they'll do anything they have to get water. Water, it's true, flows uphill or downhill or anyway, up or down to money. There's just no question about that, which brings me to the next issue I want to spend just a few moments with, and that's agriculture and agriculture water.

The eastern part of Colorado has had one of the toughest years, I think, in history as far as a good growing year. It was a late year, it was wet and cold to begin with, and we weren't able to get crops planted in the proper time. And then what happened? We had an early frost. Coupled with that, we also had a year when the agricultural economy was bad, particularly in the livestock end of it. Livestock is really a big part of the agricultural economy in our state. Agriculture is probably the number two or three producer in our economy depending upon the year, and of that, 60% of the

agricultural paycheck is credited to livestock. Well, this is the year where you have the livestock cycle down on the bottom side and then you have a short growing season and all my city cousins say "You guys are having a heck of a year out there. You're getting $5 for that wheat, you're getting $3.25 for the corn and it must really be great." And then I tell them, "You know we didn't raise anything to sell and that's why those prices are so high." A lot of my friends out in the Burlington area and on out the Southeast side almost all the way from Lamar to Julesburg have had a situation where nearly 50 bushels to the acre are lying on the ground. I've even seen guys going out and bailing those corn acres to pick up that corn in the form of a bail so they can grind it and recover some of it. Agriculture sits out there owning a whole lot of water. If you can call it a profit margin, they might have one in the right year and it's a very slim one. So does it really surprise anybody when agriculture decides that maybe they don't want to stay in the agriculture business and the only thing they really have of value is their water?

Do we really think that we're going to see a shift of agriculture water to municipal use under those kinds of economic circumstances? Do we honestly think the public of the State of Colorado and this nation is worried about where the next mouthful of food is coming from? Don't believe it. People take food for granted, just like they take peace and freedom for granted. We have a big job ahead of us, and that's informing the public about how we're going to sustain this standard of living we enjoy, how water fits into that, and how we need to deal with water and water development before it's too late -- before our water is demanded out of the State of Colorado, before they throw out all of our compacts and say, "No, No, it's a new age. We don't want any of that anymore. We're doing different things now, people have different needs and they want different things." I can't say it enough. I know I'm rambling a little bit and repeating myself, but I feel it so deeply, and I was one of the fortunate ones. I told you last year when I was here, when you walk around on the Western Slope with your grandfather like I did, and walk up and down those mountain hills and see those little ditches that were scratched out of the rocks, those open and closed head gates, and those little trickles of water going to irrigate a little pasture here or irrigate a little crop there; or, you go out on the eastern slope with my other grandfather and walk around where they bounded their farm, built a little reservoir and ran that water down little dirt ditches, and a lot of times by the time the water got down to their farm it had all soaked into the ditch banks and they didn't have any water for their sugar beets or their corn; when you do those kinds of things, you learn about exactly what has happened to put in place a water system today that certainly serves mankind well but is not going to serve mankind into the future as we're already seeing on the Arkansas river.

Our committee this year will look at some pieces of legislation to try and help you out on the Arkansas river. Some of it will come forward through the Water Conservation Board, Chuck Lile and the State Engineer's office. This will help you, I support this idea. I think we have to allow some grant and loan programs to help so you can live with the situation in which you find yourselves. We are not through litigating all of this, as I'm sure Dave Robbins told you yesterday. The sad part of this story is, the answer to what's going on with the Arkansas River, the South Platte River and the Rio Grande river is we need more water in the river basins. Just because some people are willing to sell their water, quit that particular use, and let somebody else use it a different way is only taking it out of one pocket and putting it into another. Overall, in my view it does not solve the problem. When we're running 800,000 af out the Colorado River, when we run extra water out of the South Platte in certain years -- and we ran out a great deal last year -- Marian, you should have asked Jess why he didn't store up all that water we sent down the river to him. Until we figure out ways to start doing that we are not going to do anything but take water out of one pocket and put it in the other or change it to a higher and more expensive use. I can't blame anybody that has the right to use water selling that right to somebody else when they can make a lot of money doing it. And isn't that a sad commentary on our times?

Ladies and gentlemen, those are the critical issues that we need to look at today. And I will tell you, in the City of Denver, when those legislators meet, that is not high on their list of concerns. I tried this summer to get an interim committee on growth and water and land use so we could take a look ourselves -- legislators and elected officials from all the districts of the State of Colorado -- at how we're going to deal with land use and water, as we look at the growth and as we look at the pressure on our river basins. That didn't even get considered. It was not of high interest. The Governor was doing his growth seminar and my legislative colleagues didn't think that was important. And so here we are -- a year when we're going to have to litigate the damages on the Arkansas river, when we're going to have to fight the recovery programs that we're looking at on the South Platte and the Colorado River, and we will have to make some far reaching decisions on the direction in which we are going with water policy in the State of Colorado. But we don't

have anybody interested in doing that except people like yourselves who will come to this room and listen to us harangue about how our forefathers did it and how we ought to start doing it. That's why I'm here, because I think you have a critically important role to play, and because of circumstances, you're the first ones that have to go through the battle. I want you to know that I will stand here with you when Mark Obmescik from The Denver Post says, "Why in the world should we help those people out there on the Arkansas river? They knowingly stole that water from the State of Kansas." That's the kind of thing I'm talking about.

People have to understand just exactly what's going on in this business, that what's good for agriculture is good for them, and they have to understand how this system works and that everybody can use that water. We can use it six or seven times before it runs out of the State of Colorado if we take care of it. We have to protect the quality of it, certainly. That's an issue that we aren't going to forget, but we all have to first store the water and then systematically use it together for the future of our state and to sustain the standard of living that we've all come to enjoy. Our forefathers figured it out. Why in the world can't we figure it out? I understand there are a lot more people and different demands, but we have to do it. It's our future. Maybe it's because I have a grandson now that I'm worried about it, but those are the issues that we will deal with. And that's the thing that we need your support on and you need ours. And so I hope, Steve and Ralph, we're going to continue to have a dialog about how this goes. The business at hand is worth doing and it really is the future.

Flood Control Activities in the Arkansas Basin

Jim Townsend, Chief
Southern Colorado Project Office
Corps of Engineers, Albuquerque District

We're in a time when much of America seems to question the value of its public servants. All great countries have a great civil service. The Army and the Army Corps of Engineers have served America for 220 years. We're part of the Federal Government, a part that has kept this country free and prosperous since before we were a country. The Corps was founded on June 16, 1775 -- a full year before the signing of the Declaration of Independence. We're very proud of our service. Our mission in Colorado remains flood control, evaluating permit applications under Section 404 of the Clean Water Act, and providing assistance to state and local governments on any water resources issue. We are here to serve you and we welcome that opportunity to do so when we can. As many of you know, there are three Corps districts serving Colorado. I'm part of the Albuquerque District; we cover the Arkansas and Rio Grande drainage basins in Colorado. The Sacramento District covers the Western Slope and the Omaha District covers the South Platte.

Let me turn my attention to the Arkansas Basin. The Corps has had a great influence on flood protection within the Arkansas Basin. I'm going to highlight some of these projects for you.

John Martin Reservoir was authorized by the 1936 Flood Control Act and construction was started in 1940. By March of 1943, the World War II demand for men, supplies and material caused construction to cease. However, the project was completed in 1948 and renamed for Colorado Congressman John E. Martin. As we heard yesterday, John Martin is a vital part of the comprehensive plan for flood control and management of the water resources in the Arkansas Basin. Our flood capacity in John Martin is 261,000 af. John Martin was completed at a cost of $15.25 million dollars. To date it has provided flood control benefits of $87.7 million dollars. It has more than 5 times paid for itself. This past year, 1995, it provided $67,400 dollars in flood control benefits. Since it was constructed, we don't have the flushing flows below John Martin that we once had and channel capacity is a concern. The State of Colorado wrote to us in early December and asked for our assistance. Under our Planning Assistance To States program, we are lookinng forward to conducting a study on the channel capacity issue below John Martin Dam. This will be a cost shared study with the State. We hope to initiate that study within the next year.

Trinidad Lake, built on the Purgatoire River, was authorized by the 1958 Flood Control Act and completed in June of 1977. Like John Martin, it is also a multi-purpose project affording flood protection, irrigation, water storage, recreation and the addition of sedimentation control. In 1994, the Corps revised its water control manual to allocate excess space to the recreation and fishery pool. We have increased that pool from 4,500 af to 15,967 af. This essentially doubles the surface acres of that fishery and recreation pool from 273 surface acres to 563 surface acres. The State of Colorado is actively working to secure water to fill this additional space. Our flood control capacity at Trinidad is 51,000 af.

Pueblo Reservoir was completed by the Bureau of Reclamation and is a vital part of the Fryingpan-Arkansas Project. The Corps of Engineers is the responsible federal agency for flood control regulation in Pueblo Reservoir. Flood control capacity is 93,000 af between the months of April and October. Between November and March, that flood control capacity is shared to allow a winter water storage program. In 1995, the flood control benefits from Pueblo Reservoir were $832,000 dollars. Cumulatively, we have had $5.2 million dollars in flood control benefits from Pueblo Reservoir.

The Albuquerque District has also completed many other projects within the basin. I will briefly mention these: the Arkansas River Levee extension in 1952, the Fountain Creek Floodway in Pueblo in 1989, the Templeton Gap Floodway in Colorado Springs in 1949, the Holly Levee in 1980, channel Improvements and levee at Wolfe Creek in Granada in 1980, and the Las Animas Flood Control Levee in 1978.

The Corps offers many programs to assist state and local communities with water resources issues and we again welcome any opportunity to meet with you concerning these issues.

Let me talk just a few minutes about the Corps regulatory program. This is a federal permit program that requires folks that want to do construction within waters of the United States to obtain a permit from the Corps of Engineers before they start construction. The Corps has been in the business of regulating navigable waters since 1899 through our authorities under the Rivers and Harbors Act. However, in the 1970s Congress gave us a new mission, and that was to regulate the discharge of dredged or fill material under Section 404 of the Clean Water Act. Over the last 20+ years we have seen this program increase in its requirements to protect the aquatic environment through judicial and legislative changes.

Waters of the United States include navigable waters and non-navigable waters such as the Arkansas River in Colorado and its tributaries. Most of these tributaries may be dry for most of the year but they are still waters of the United States. We have some isolated waters that are jurisdictional such as playa lakes. Wetlands are also jurisdictional. Wetlands may occur adjacent to a stream or they may be isolated depressions on the landscape. In some cases, the Corps regulates man-made waters such as constructed impoundments and water bodies or wetlands resulting from man borrowing material from the ground and abandoning this mining pit.

How do you know if you need a permit? Because of all the regulation changes that have occurred, and the most recent change in September of 1993 which resulted in regulating excavation activities in non-navigable waters, I'm advising people that if you are planning any type of ground-disturbing activity in a waterway or wetland to check with the Corps first. Most of the activities that require permits in Colorado are covered by general permits. As a result, most people receive their permits within an average of 14 days. There are also some activities that are exempt from our program. Let me highlight one of the exemptions because it is very important within the West and particularly within the Arkansas basin. The construction or maintenance of farm or stock ponds or the construction or maintenance of irrigation ditches are activities that are exempt and do not require permits from the Corps of Engineers. Many of you know this. We do receive calls from ditch companies regarding the need for permits to maintain their diversions and ditches. As long as it involves work to maintain their diversion or maintain their irrigation ditches, this work is exempt and does not require permits from the Corps.

When a dredge or fill activity is not exempt, its going to require some type of permit from the Corps. In order to reduce the regulatory burden on the Corps and to more efficiently utilize our limited resources, the Corps has developed general permits for activities that have minor, individual and cumulative impacts. There are two types of general permits I will describe: the nationwide permits and the regional general permits. The nationwide permits authorize similar activities throughout the entire nation. Many of these permits do not require notification to the Corps. With those that do require notification to the Corps, we're required by regulation to act within 30 days after we have afforded other federal and state agencies an opportunity to comment. Again, the vast majority of the activities that we do permit in Colorado are covered by these general permits. These nationwide permits are scheduled to expire in January 1997. Our headquarters will be publishing in the federal register within the next couple of months a proposal to reauthorize these nationwide permits for the next five years. Reauthorization of these nationwides is required every five years. During this comment period, you will be afforded an opportunity to comment on the existing nationwide permits as to whether you feel they ought to be changed, and we hope to propose some new nationwide permits for other activities. Regional general permits authorize similar activities within a given region of the country. It's very common for a Corps District Office to develop regional permits within its permit boundaries for certain activities. Since there are three districts in Colorado, we work together to develop general permits which are applicable throughout the entire state of Colorado. Some examples of these statewide regional permits include: stream habitat improvements, road crossings, recreational placer mining and some minor dredging activities.

When an activity is not exempt or not covered by a general permit, we require a more detailed review called an "individual permit review." The regulations require that we afford an opportunity for public comment. We will issue a public notice for a project that requires an individual permit and allow a 30-day comment period. We also conduct an alternative analysis to ensure that the alternative proposed is the one that has the least damage to the aquatic environment with consideration given to cost, technology, and logistics. We also conduct a public interest review, because we are charged with not issuing a permit if we find it contrary to the public interest. What generally happens on these individual permit evaluations is that we may issue the permit as the project was proposed to us or we may find that we

may have to add special conditions to the permit to mitigate or offset impacts to the environment, to historic properties, or other public interest factors.

Once we issue permits, we conduct compliance inspections to ensure the work is in accordance with the permit. We also work closely with the Environmental Protection Agency to investigate and resolve unauthorized activities. Both of our agencies have the authority to direct the removal of unauthorized activities, to seek administrative penalties, or to seek civil or criminal penalties.

Q. I understand the Corps received a letter from the state requesting assistance on channel conveyance. Will this study include the La Junta area?

A. The letter we received from the state did express concerns up and down the Arkansas. The immediate priority, though, was to look at the area below John Martin Dam. We're willing to look at the area above it. It's just a matter of the State's priorities as to when we might do that. Additional letters from Otero County to request this assistance from the Corps of Engineers would help. When we get involved in these studies, of course, they're cost shared, so we're going to need a local sponsor with the ability to cost share these studies or to eventually cost share a project and then take over the operation and maintenance of a project. This can be quite expensive. So, we're willing to work with Otero County, and consideration should be given to several local communities combining efforts to sharing the required sponsor costs. Without that ability to cost share, we're going to need special legislation from the Congress in order to do a project where it is 100% federally funded.

Q. What alternatives are we considering to the channel capacity concern below John Martin?

A. We haven't initiated that study, so we are going to keep an open mind about what will be necessary. Obviously, the vegetation has grown and is choking parts of the channel, and some of this vegetation is not desirable. It is Salt Cedar, a non-native species. It may be that some good things can be done to increase conveyance by just trying to manage the Salt Cedar. It may be that parts of the river might require some dredging. We certainly don't have a position on it; we want to study it and see what needs to be done. And that's where we will be working with the locals, probably having some scoping meetings to hear where the concerns are, what parts of the river are the worst because it may be that we can't do a project for the entire stretch of the river. It may be too expensive. We may have to focus on certain segments of the river, to open them up to increase its capacity. Flushing flows are something that should be considered. We want to consider all of the alternatives but of course we haven't even initiated this study so we don't know what will come out of it. It may be a combination of alternatives.

Q. Do I need a 404 permit to maintain my farm's seep ditches?

A. No you don't. The maintenance of these seep ditches would be exempt. (continued question- What if wetlands are growing in the ditches?) A. Even if wetlands are present, this exemption would allow you to maintain these seep ditches, so you wouldn't need a 404 permit for that activity. (continued question- Who is responsible for maintaining the ditches?) A. The drainage district or the land owner.

Q. What is the functional life of John Martin Reservoir?

A. I don't have a year figure for you. Certainly I see the project effective at least over the next 100 years, maybe longer. It all depends on how much sediment comes into it and reduces the storage capacity.

Q. So the Corps does not maintain John Martin Reservoir.

A. No sir. We're charged with maintaining that facility and we will do so.

Q. How will we know when the nationwide permit reauthorization comment period begins?

A. The Corps Districts will issue public notices to the people that are on our mailing list to advertise the nationwide permits are up for renewal and they will also be advertised in the federal register.

Q. How does the Corps calculate benefits from its projects?

A. Our economists have a formula that we use to determine those amounts. It's a little too complicated for me to try to explain this morning. If you would like more information on that, Mike, I can put you in touch with our economists.

Q. Will the public notice be on the InterNet?

A. I'll check with our headquarters and even mention that they should. We are starting to put more things out on Internet and that's an excellent, excellent idea. I appreciate it.

Q. Has the construction of Pueblo Reservoir decreased the sedimentation in John Martin Reservoir?

A. I don't know, Ralph. You know that is such a big basin below Pueblo Reservoir coming into John Martin. It's so big that folks have talked to us from time to time about why can't the Corps decrease our flood capacity and allow for more irrigation storage of water. We feel very strongly that it is a large enough watershed that we need to keep the flood capacity amount. Because the watershed is so large, Pueblo may not have that much of an effect as far as decreasing the sedimentation. Good question.

How Much Do We Have and Who Owns It?

Steve Witte, Division Engineer
Colorado Division of Water Resources

How much water do we have, and who owns it? I wish that these relatively simple questions had relatively simple answers. An exacting quantification of how much water there is within the Arkansas River Basin is complicated by missing or highly variable data; timing and location; shared use of a commonly owned resource which can lead to double accounting; priority; operational decisions; and I'm sure there are several other factors.

To illustrate that, anyone who has any experience dealing with water realizes that the water supply can be extremely variable from one year to the next - witness last year compared to the year before that -- and it also can vary within the same season. Last year at this time we thought we were headed toward a pretty sorry year. Then, late in the Spring Mother Nature turned all that around and we had a very abundant year.

There is always more water available in downstream reaches. For example, there is always more water available in Canyon City than in Leadville, because at that location the River has been swelled by a number of tributaries. Regarding double accounting, consider that the water that enhances someone's picnic experience up in the national forest may be the same water that provides for someone else's's rafting recreational experience; it may provide someone in Pueblo with a shower, it may irrigate melons in Rocky Ford, and it may also contribute to usable state line flow. So how do you account for that water?

The amount of water that is in the river at any particular location and time, that is available for any particular use, may be subject to Colorado's allocation system which is based on priority of appropriation. Or, it may be the result of someone's operational decision, such as when the owner of a reservoir directs the release of water previously appropriated into the stream system for subsequent use.

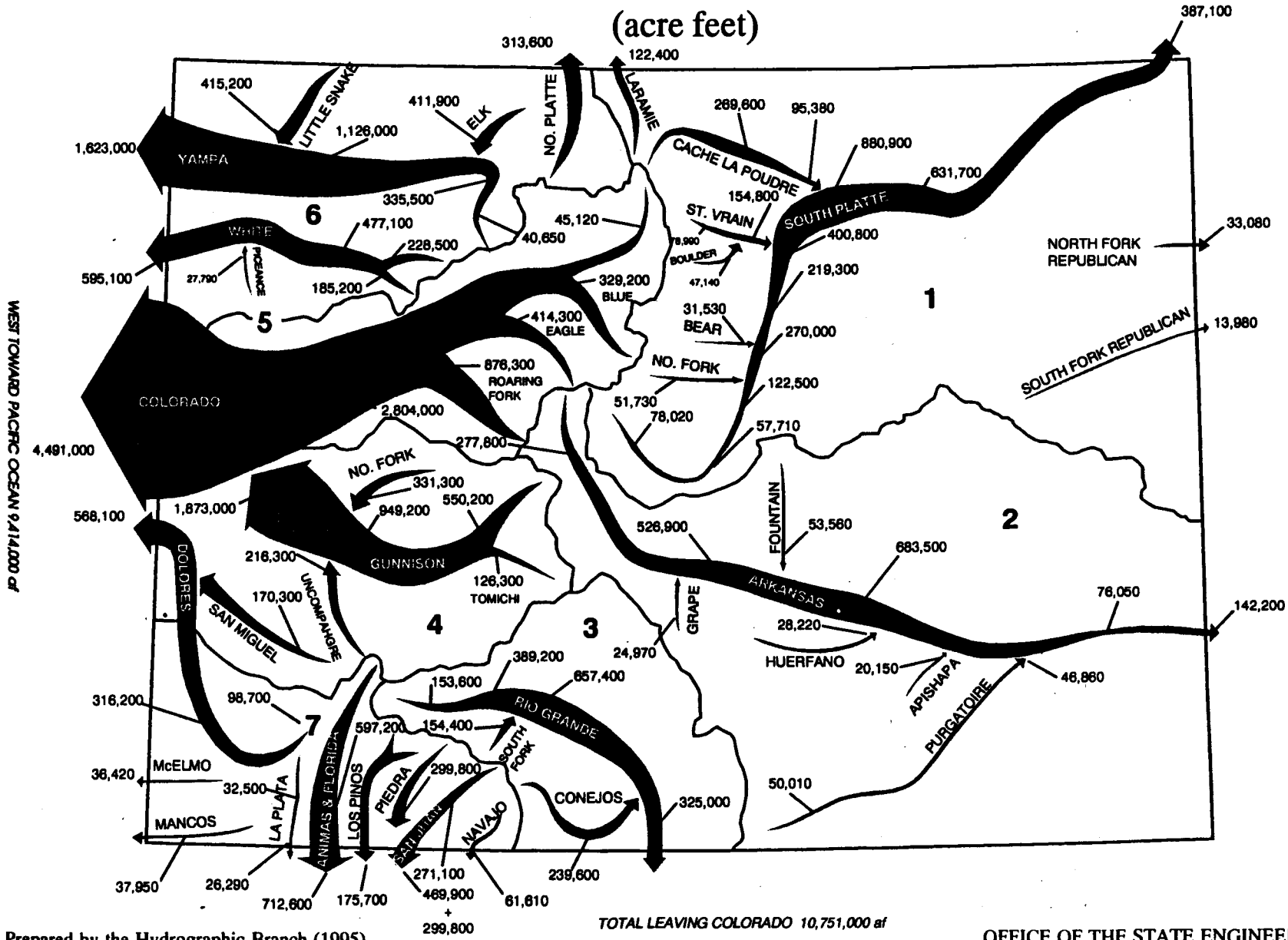
Looking at some long-term average stream flows can begin to give one a sense of the net effect of some of these variables on water supply and smooth out the timing consideration by looking at a broader expanse of time.

Figure I illustrates how the water supply varies at different locations in relation to the contributing watersheds and the regions of most intensive use. What is shown here are average historical stream flows at various locations. Near Leadville, the number is 278,000 acre-feet (af). I assume this location (further downstream) represents the Portland gage above Pueblo reservoir, where the average annual stream flow is roughly 527,000 af. Contribution of the Fountain is 53,000 af, the Huerfano 28,000 af, the Apishapa 20,000 af, and the Purgatoire roughly 47,000 af. But by the time one gets down to this location (near John Martin Reservoir), the supply has been reduced to 76,000 af and the outflow at the state line is about 142,000 af.

Figure I also gives a sense of how the Arkansas compares in its historical yield to some of the other major river basins in the state. In the South Platte, for example, the high is on the order of 880,000 af, and that has reduced by the time it exits the state to 387,000 af, which is considerably more than the outflow from the Arkansas Basin. The Rio Grande outflow averages about 325,000 af. On the West Slope, you can see without looking at the numbers and just looking at the relative size of the arrows that this is where the real water is in this state.

It should be remembered that these are stream flow figures and will include both transmountain and native components. By summing the average annual stream flow measurements over a period of time for selected gaging stations, one can estimate the average total basin inflow. By doing that for the period 1980 through 1994, I came up with a number of about 875,000 af. Deducting from that the average total transmountain imports over the same period of time (125,000 af known because of independent measurements of water brought into the Arkansas River Basin), I arrived at an average total native inflow of about 750,000 af for the period. One published report that I am aware of has placed this

FIGURE 1. COLORADO HISTORIC AVERAGE ANNUAL STREAM FLOWS (acre feet)



Prepared by the Hydrographic Branch (1995)
Historic averages obtained from USGS Water-Data Report CO-93

OFFICE OF THE STATE ENGINEER
COLORADO DIVISION OF WATER RESOURCES

undepleted average annual native supply at 875,000 af, and that is just the native component alone. So, as you can see there can be tremendous variations just by using different time periods, and I suspect that this report also attempted to estimate the depletions upstream of some of these gaged locations.

During the '80 to '94 time period, transmountain imports constituted about 14 percent of the total water supply. The largest of these transmountain diversions was the Boustead Tunnel, which is the Fryingpan-Arkansas Project delivery structure and which averages about 55,000 af. According to the USGS, the total basin outflow average for the period 1951 to 1994 was approximately 142,000 af, so that agrees very well with Figure 1. However, it does not include the outflows from the state carried through the Frontier Ditch, which is a ditch that diverts in Colorado but provides water to users in Kansas. Nevertheless, even recognizing some of the short coming in this data, it is evident that a significant portion of the physically available water supply in Colorado is used in Colorado.

Next, I would like to briefly examine some information that we have pulled out of recent diversion records. The following are diversions of native water for 1992 and 1993 by use type:

Irrigation diversions	1.5 million af
Native municipal use	630,000 af
Industrial use	93,000 af
All other uses	142,000 af
Total	1.848 million af

If you adjust figures by an assumed 150,000 af for pumping of tributary groundwater for irrigation purposes, that is the long-term average estimate of pumping. Then, the diversions as a percentage of the total native diversions for each of those categories become:

Irrigation	85 percent
Municipal	3 percent
Industrial	5 percent
All other uses	7 percent

I would like to point out that what I have cited pertains to recorded native diversions and then I adjusted for some unrecorded diversions for which we have reasonably reliable estimates of tributary pumping. One must bear in mind, however, that there are other uses for water for which we do not maintain any diversion records per se. An example is the Colorado Water Conservation Board's minimum stream flow rights, numbering over 120 and scattered throughout the Arkansas River Basin, which range from.5 cubic-feet-per second (cfs) to over 20 cfs. Generally these are thought to be non-consumptive uses, but nevertheless they are a beneficial use within Colorado.

Additionally, there are other types of uses for which we do not maintain diversion records. For example, many exempt-type wells (stock-water wells, domestic house wells, and the like) are not reflected in those figures. Some of you are saying, "Hey, wait a minute. Didn't he just say that the total average native basin supply was something like 750,000 af, and in those two years the total diversions were on the order of 1.85 million? Something just doesn't add up." Well that is exactly right. This is one of those cases where the sum of the parts is indeed greater than the whole. I think this is the basis for the old adage, "One man's return flow is another man's water right."

I'm still not sure I have adequately answered the question of who owns it. The idea of ownership fascinates me. Yesterday you heard David Robbins articulately outline how Colorado's ownership of water has to be viewed from within the context of Colorado's entitlement to use water under the Arkansas River compact.

I believe there are also some common misconceptions regarding the nature of ownership of water rights. The Colorado Constitution, Article XVI, section 5, provides that the water of every natural stream not heretofore appropriated within the State of Colorado is hereby dedicated to be the property of the public, and the same is

the State of Colorado is hereby dedicated to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation, as hereinafter provided. Section 6 of the same article goes on to say that priority of appropriation shall give the better right.

The process of determining a water right is established by statute through the water courts, and ownership of water rights is vested at that point in time with the appropriator. Furthermore, statute provides that in all conveyance of water rights, except where the ownership of stock in a ditch company or other companies constitutes ownership, that the same formalities shall be observed and complied with as in the conveyance of real estate. So, in theory at least, the title to ownership is traceable through time. However, often in practice this is very difficult because of inattention to the details evidencing those changes of ownership.

The misconception that I would like to try to address is, What does ownership of a water right mean? We tend to think of our rights of ownership in real property in absolute terms. But they really are not -- zoning laws, covenants, all have an effect on what we can do with property or real estate that we may own, to the extent that our preferred use may impinge on the rights of others to use or enjoy their property. Similarly, there are restrictions on ownerships of water rights.

David Robbins used the term usufructuary yesterday. I went home and looked that up. Webster defines usufructuary as the right to utilize and enjoy the profits and advantages of something belonging to another, so long as the property is not damaged or altered. In simpler terms, the rules pertaining to water rights are similar to those that applied to the use of the family car when you were a kid.

What happened if you failed to bring the car home at the appointed time when Dad needed it? Your use was curtailed, right? That's priority -- Dad had priority. What happened if you totaled the car through recklessness? Your use undoubtedly would have been curtailed. Why? Waste of a commonly or jointly held resource. Suppose you told the folks that you were going to take the car six blocks to the Malt Shop, you left with a full tank of gas and returned with it empty. Might there have been some inquiry into your expanded use? Might there have been some future restriction on your use of the resource? Well, Colorado Courts have long held these same kinds of waste and expanded use are implied in every water right.

I hope that I have helped refine some of your thinking regarding the nature of ownership of water rights. It is extremely important to have a right understanding to promote the maximum beneficial use of the waters that we have.

Colorado Springs -- Future Needs
Executive Summary of the Water Resource Plan

Gary Bostrom, Manager
Water Resources and Planning Division
Colorado Springs Utilities and Water Resources

History:

Colorado Springs is the only major Front Range city which is not located on a major river. Denver has the South Platte River and Pueblo has the Arkansas River. Colorado Springs has an extensive water system that began when Pikes Peak streams were no longer able to satisfy growing needs of the community.

In the 1950s, Colorado Springs developed its transmountain diversion of water bringing water from the Blue River near Breckenridge to Colorado Springs. In the 1960s, Colorado Springs Utilities formed a joint venture with Aurora for the construction of the Homestake Project near Tennessee Pass. From the early 1970s to today, Colorado Springs' water system has grown to include the Fryingpan-Arkansas Project, the Twin Lakes Reservoir and Canal Company and the Colorado Canal Companies. The return flows from these transmountain projects are reused in the non-potable water distribution system, local exchanges, and exchanges on the Arkansas River.

Now, in 1996, only 20 percent of Colorado Springs water actually comes from the streams on and around Pikes Peak. The remainder comes from intricately engineered pipelines and tunnels as far as 200 miles from our city. Colorado Springs has always had to plan well in advance for its water needs.

It is this pattern of need assessment and long-term planning that have brought the Colorado Springs Water Resource Department to the development of this Water Resources Plan.

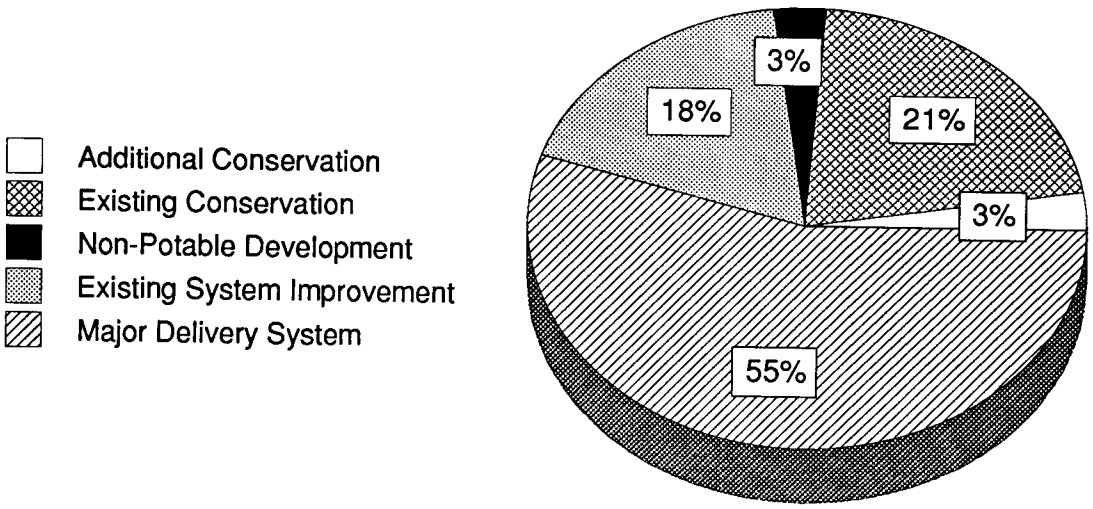
The Problem:

Although Colorado Springs has the rights to enough water supply for a city three times as large, its current capacity to deliver water to the city is not enough to meet projected needs. To ensure adequate delivery capacity, the Water Resources Department established the following goals for a 50-year plan for the future.

1. Reflect responsible resource planning
2. Be technologically feasible
3. Be cost effective
4. Be environmentally acceptable
5. Be consistent with community values

The Plan:

The Water Resource Plan components include conservation (existing and additional), existing system improvements, non-potable development and a major delivery system. The pie chart illustrates proportionately the size of each component.



The attached Exhibit A illustrates the recommended Existing System Improvements and the Major Delivery System described in this plan. Exhibit B is the Water Resource Plan Cost Summary. These were added to illustrate the geographic extent and cost of the plan.

Conservation

Alternatives considered included a full range of conservation programs and update of the Landscape Ordinance and rate structure. Colorado Springs has been able to foster a volunteer conservation program with metering, an evapotranspiration (ET) watering program, the xeriscape demonstration garden home retrofit programs and education programs.

A major theme heard in the public process was a strong desire to strengthen conservation programs. In order to encourage conservation, it is necessary to increase education programs that target all members of the community. In addition, new programs will be developed to target large and commercial landscapes by the use of irrigation audits and incentives.

Also under consideration is the development of a seasonal rate structure. Through the Water Resource Plan public process, the department has heard that using rates to encourage conservation may be an important step to take.

The Mission:

The mission of the Water Resource Plan is to provide a safe and reliable water supply to meet community's needs (through at least the year 2040). We will accomplish this through community involvement end after examination of the direct and indirect impacts of the plan upon people, neighborhoods and the environment while taking into consideration cost, efficiency, feasibility and water quality.

The Process:

For the last seven years the Colorado Springs Water Resources Department has conducted a series of technical studies to outline water resource planning information such as population forecasts, projected water use, current system capacities, development of components, environmental and feasibility studies and analysis of community values. Public meetings were held in several other communities including Buena Vista and Pueblo.

Although the input received reflected many different priorities, values and ideas, some of these were heard much more often than others. What follows are the recurring themes from the public participation process.

1. The plan should accommodate a maximum population growth forecast yet be flexible enough to be downsized if necessary.

2. Water quality must remain high.

3. Conservation is very important. A voluntary program through a strong educational emphasis is considered to be critical. Also important are a review of rates and landscape policies as methods to reinforce a conservation ethic.

4. Existing resources and supply systems should be maximized -- local supplies, delivery systems, groundwater and non-potable water.

5. The Impact on other communities and environments should be minimized

6. The plan must help protect the Arkansas River

7. Cost is an important factor to consider in choosing the right alternatives, but other factors must be considered, too.

Already under development is a revision of the Landscape Ordinance. Two goals have been identified by the Water Resources Department 1) efficient water use 2) allowing choices that are consistent with our climate. By establishing new guidelines for the community, greater conservation will be achieved by the inclusion of landscape guidelines that allow drought-tolerant and xeriscape landscapes.

Existing System Improvements

The existing local raw water collection system and the raw water delivery systems were evaluated for possible improvements to meet the mission. Local collection system improvements considered were the Pikeview diversion on Monument Creek, the Rosemont system on the South Slope of Pikes Peak and locating a new diversion on Fountain Creek in Colorado Springs. The Homestake pipeline, the Blue River pipeline and the Fountain Valley Authority pipeline were evaluated for possible increases in capacity .

Values expressed during the public process related to existing system improvements included maximizing the existing system, maintaining local streamflows, cost, protecting water quality ant minimizing impacts on other communities and the environment.

Existing system improvement recommendations are the following:

Modify the existing Pikeview diversion on Monument Creek to be a source of supply to the Mess Water Treatment Plant. Future diversions from Monument Creek would be similar to the amount diverted historically. This recommendation would provide an additional 2.5 mgd supply to the potable water system.

Shift Rosemont water supply from its current use of Broadmoor Golf Course irrigation to use in the potable water system. If all of the Rosemont water supply is used in this manner, a new source of irrigation water would have to be provided to the Broadmoor Golf Course. Alternative supplies for the golf course include treated wastewater or Pinello Ranch groundwater. The Rosemont supply would increase deliveries to the potable water system by 2.5 mgd.

Expand the Homestake (a.k.a. Otero) pipeline system so that an additional 13 mgd can be conveyed from the upper Arkansas River to Rampart Reservoir. Improvements include modification to the Otero Pump Station and paralleling about 12 miles of the Homestake pipeline with new pipe. This recommendation could be accomplished in several phases.

Non-Potable Water Resources

This planning process considered expanding the use of two non-potable water resources, groundwater and treated wastewater. Studies evaluated the use of groundwater for park irrigation and other large irrigated areas. Extending the non-potable water distribution system to the Broadmoor Golf Course and the Airport area were investigated. Large non-potable distribution system expansions on the order of 15 mgd and 24 mgd were also studied.

Comments that were heard during the public process related to non-potable water resources included using these resources where it makes sense, a large scale non-potable distributions system is not acceptable, and maintain the existing policy of using these resources for irrigation uses only.

A goal of this plan is to at least double the use of non-potable water resources from the current level of 2.5 mgd to 5.0 mgd over the study period. An existing barrier to the extension of the non-potable water distribution system is the customer's cost of extending the system. The existing policy allows the Water Resources Department to financially participate in extending the system where it is economically viable. Doubling the use of these resources would defer the need of a major delivery system by about one year, resulting in a savings of several million dollars. This savings does provide a framework for the Water Resources Department to financially participate in extending this system.

Major Delivery System

Alternatives considered included looking at a Western Delivery System, a Southern Delivery System and a Reclamation System.

Western Delivery System: A pipeline system from the Buena Vista area to Rampart Reservoir.

Southern Delivery System: A pipeline system from Pueblo Reservoir to a reservoir site near Colorado Springs

Reclamation: A system of pipelines, reservoirs and water treatment plants used to treat wastewater effluent to meet drinking water standards.

After much discussion within our public process, with regulatory agencies and among our staff, out recommendation is to construct a southern delivery system which would not require a dam on the Arkansas River. Storage may be obtained in Pueblo, Twin Lakes and Turquoise Reservoirs. Work will begin in 1996 and will continue through about 2015. Planning and permitting will follow guidelines for high projected growth in Colorado Springs. The Water Resources Department will monitor supply and demand throughout the planning period, adjusting plans accordingly.

Rate Analysis

The financial rate model used by the Utilities Finance and Management Services Department used to evaluate the plan's rate impacts through the year 2020. As expected, due to large investment for a new delivery system and the continuing cost of infrastructure maintenance and development, there is a need for future rate increases. This model reflects that by the year 2020, water rates will have increased at a growth rate less than inflation for the selected alternatives.

Regional Water Planning

During the public participation process the issue of regional water planning was raised. Regulatory agencies are strongly encouraging regional plans and projects so that single water systems can be built to address regional water needs. Also, water providers within El Paso County have requested discussions to investigate the possibility of a joint venture with Colorado Springs. Most of the proposed facilities included in this plan are affected by the quality and quantity of stormwater and wastewater originating outside of Colorado Springs. In order to manage and protect the proposed future water supply, regional water resource planning and management may be an appropriate role for the Water Resources Department .

The plan recommends that discussions occur among El Paso County water, wastewater and possibly stormwater agencies including the Colorado Springs Water Resources Department. The purpose of these discussions would be to identify possible opportunities for a joint venture and to determine what type of structure such as an authority would be most appropriate.

Additional Participation:

Through the month of March, the public participation process will continue to test the preliminary plan that was presented to Colorado Springs City Council at the February 12, 1996 workshop. The following schedule will be used to test the plan within our community in Pueblo and Buena Vista:

Open houses in Colorado Springs, Pueblo and Buena Vista
Local and regional media briefings
Additional customer surveys
Mall displays at Chapel Hills and the Citadel Mall

This information will be added to the Public Information Document and will assist the Water Resources Department in refining the plan.

EXHIBIT B

Water Resource Plan Cost Summary:

System	Million Gallons Per Day	Capital Cost
Existing Conservation:	[20 mgd]	$0.00
EPAct Guidelines ET Program Xeriscape Garden and Programs Conservation Education Programs		
Additional Conservation:	2.5 mgd	$14.6 million
* Irrigation Incent, .24 mgd, $1.7 mil. * Rain Sensors, .76 mgd, $1.9 mil. * Commercial Audits, 1.03 mgd $9.7 mil. * Landscape, Audits, .44 mgd $1.3 mil.		
Non-Potable Development:	2.5 mgd	$TBD per proj.
* Airport Irrigation Project, .39 mgd, $8.8 mil. * Broadmoor .42 mgd, $4.8 mil.		
Existing Systems Improvement:	17 mgd	$100.5 million
* Pikeview, 2.1 mgd, $8 mil. * Rosemont, 2.1 mgd, $19.5 mil . * Otero Pipeline, 13.0 mgd, $73 mill.		
Major Delivery System:	53 mgd	$ 486 million
* Southern Delivery Also considered: Reclamation & Western Del. System **Total** 75 mgd (Projected Need)	$601 million**	
Approximately		

**Non-potable Extension Costs TBD per Project

Maintaining Water Quality

Bradford Austin, Program Manager
Agricultural Chemicals Program
Colorado Department of Health

As part of a program established by Senate Bill 90-126, the Colorado Department of Health and Environment has been collecting groundwater quality data around the state for the last four years. I work with the Colorado Department of Agriculture and CSU Extension to collect this data, which we use to see if fertilizer (nitrates) and pesticides are getting into the groundwater. We sample groundwater all over the state, and in 1994, with a follow up in 1995, the Arkansas River was the third area that we have intensively sampled.

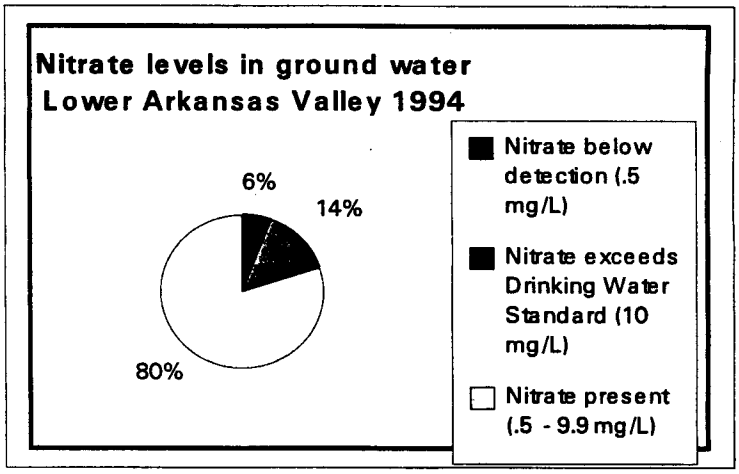
I collected 139 samples from 139 wells starting at the boundary with Kansas and working upstream to Pueblo. In previous studies we used exclusively domestic wells, but here in the Lower Arkansas valley there were not enough domestic wells to give the coverage I needed. As a result the Arkansas study consists of a mixture of irrigation, domestic wells, and stock wells -- probably about 50 percent irrigation wells. Due to the high mineral content, not as many domestic wells are drilled into the shallow, alluvial aquifer which follows the Arkansas River valley.

This alluvial aquifer is a shallow, sand gravel deposit along the river rarely more than just a few miles wide with some exceptions as it goes up tributaries. Depth of groundwater is anywhere from near the surface to a few tens of feet below. This is the aquifer on which we concentrated in the Arkansas study, as it is the aquifer that is most susceptible to contamination from the surface.

Our analysis of samples was quite extensive. We were trying to establish a baseline from which any future sampling could follow. No one had sampled the Arkansas groundwater quality this extensively in over 25 years, so we analyzed for everything we could possibly afford. The inorganic analyses were done at Colorado State University's Soil and Water Laboratory in Fort Collins.

Total dissolved solids (TDS) is probably the largest and best known problem with the groundwater in the Arkansas. Seventy-five percent of the samples had a TDS higher than 1500 mg/l. Five-hundred mg/l is the recommended limit for drinking water, and even the minimum is close to that. Of all the minerals that combine to determine TDS, sulfate represents about one-half of the dissolved mineral in the Arkansas samples. Sulfate is therefore the dominant mineral component that characterizes this ground water as what is locally referred to as 'hard" water. The sulfate is derived from the shale formation that underlies most of the valley and is concentrated by the water use pattern.

The major inorganic chemical that we look for, because of its human health impact, is nitrate. In the pie chart, I have summarized the survey results for nitrate. You can see that only six percent of the wells had no nitrate detected. The detection level was 0.5 parts per million (ppm) or milligrams per liter (mg/l). In the bulk of the data, about 80 percent, nitrate falls in the range from 0.5 mg/l, the lowest level where we detected nitrate in the sample, up to 10 mg/l the standard for drinking water. We use the drinking water standard as a benchmark



because the alluvial aquifer is used as a drinking water supply throughout its entire length, although several of the wells we sampled were irrigation and stock wells. Fourteen percent of the wells exceeded the drinking water standard of 10 mg/l, and with the exception of one, the majority of that exceedance is in the 10 to 20 mg/l range. We are over the standard with that 14 percent, but we are not way over -- up to about double it.

Looking at how these nitrate values map out we see the majority of the aquifer area, like the majority of the samples, falls in the range of above-detection level (0.5 mg/l) but below the drinking water standard (10 mg/l). The nitrate contamination is widespread throughout the aquifer, but currently at low levels. The samples that have exceeded drinking water standards tend to occur in isolated area at this time.

Pesticides are a big part of our work and a major concern for us because of their toxicity. There are quite a lot of pesticides used in this valley because of the agriculture, and some are known to make their way into groundwater in other areas of the state as well as nationally. The pesticides that we analyze for are listed in the table below. The analysis is done at the Colorado Department of Agriculture Standards Laboratory in Denver. When we talk about pesticide levels, we are talking about micrograms per liter, or parts per billion (ppb). So, all pesticide numbers are a factor of 1000 times smaller than the inorganic numbers we have discussed up to this point.

In the pesticide analysis for all 139 wells, I found only three pesticides, and two of those I found in only one well -- Metolachlor and 2,4-D. The only pesticide that I found to be widespread, that is, found in more than one well over a large area, was the herbicide Atrazine. This is not surprising, because Atrazine is a very persistent pesticide, highly mobile, and once it gets in the groundwater it tends to stay there.

Although I found it spread throughout a large area in 12 distinct samples, the Atrazine concentration never exceeded the trace level. Trace level means that a chemist positively can identify Atrazine in the samples but there is not enough present that he can quantify it with a number. This means, for our survey, that the level of Atrazine did not go above 0.5 ppb. That is good news for the Arkansas River. The Environmental Protection Agency considers the maximum allowable level for Atrazine in drinking water to be 3 ppb., and in these samples it never exceeded 0.5 ppb. The wells with the Atrazine tended to be concentrated in Bent and western Prowers County.

This data was collected from June to November, 1994, and in 1995 1 went back to the Arkansas to do some confirmation sampling. I resampled all the wells that had nitrate levels greater than 10 mg/l and any well with a pesticide detection. I have compared the 1994 versus 1995 levels for nitrate. Statistically, the two surveys were the same, and that was good news for us because it confirmed that our field technique and laboratory methods were correct and we had done a good job the first time around.

In the resampling for pesticides only Atrazine was detected. The well with the Metolachlor and 2,4-D didn't show up the second time around, and since that was only a trace level, it is not surprising that it might have disappeared. The range of values went anywhere from 0.12 ppb up to 0.38 ppb with one well that had 4.2 ppb. That one really shot up and went over the MCL for Atrazine. We will track that one in the future.

In the coming year we will be working along the Front Range, particularly concentrating on some of the urban areas, to see if pesticide and fertile use in the urban environment is causing groundwater contamination.

Table 1

ARKANSAS VALLEY ALLUVIAL AQUIFER
LIST OF ANALYTES

BASIC WATER QUALITY CONSTITUENTS	DISSOLVED METALS
Boron	Aluminum
Bicarbonate	Barium
Calcium	Cadmium
Carbonate	Chromium
Chloride	Copper
Magnesium	Iron
Nitrate	Lead
pH	Manganese
Sodium	Nickel
Specific Conductance (TDS)	Molybdenum
Sulfate	Phosphorous, total
Potassium	Zinc
Alkalinity, total	
Solids, Total Dissolved	
Hardness, total	

PESTICIDE COMPOUNDS

Name	Use	Name	Use
Alachlor	Herb	2,4-D	Herb
Atrazine	Herb	Dicamba	Herb
Benfluralin	Herb	MCPP	Herb
Chlorpyrifos	Insect	MCPA	Herb
Chlorthalonil	Fung		
Cyanazine	Herb	Aldicarb	Insect
DDT	Insect	Aldicarb Sulfone	Insect
Endrin	Insect	Aldicarb Sulfoxide	Insect
Heptachlor	Insect	Baygon	Insect
Heptachlor Epoxide	Insect	Carbaryl	Insect
Lindane	Insect	Carbofuran	Insect
Methoxychlor	Insect	3-Hydroxycarbofuran	Insect
Metolachlor	Herb	Methiocarb	Insect
Metribuzin	Herb	Methomyl	Insect
Trifluralin	Herb	Oxamyl	Insect
Hexazinone	Herb		

DATA SUMMARY
LOWER ARKANSAS VALLEY
1994

Area: Lower Arkansas Valley, below Pueblo to State line

Media: Arkansas River alluvial ground water

Dates: July 1994 - December 1994

No. Wells: 139

Analysis: Pesticides, nitrate, basic inorganics, dissolved metals

Table 2 **Pesticide Detections**

Pesticide	Detections	MDL	PQL
Atrazine	12	0.05	0.5
Metolachlor	1	0.05	0.5
2,4-D	1	0.02	0.2

MDL - Minimum concentration that can be detected by this method in parts per billion.
PQL - Concentration at which level can be quanitized in parts per billion.
Note - All detections were at trace levels, i.e., between MDL and PQL.

Descriptive Statistics

	Nitrate	TDS	Sulfate	Sodium	Chloride
	mg/L				
Mean	5.31	2,359	1,183	279	165
Standard Error	0.41	87.98	50.54	14.91	20.03
Median	4	2,397	1,191	238	72.5
Mode	0.25	2,032	1,175	111	15.9
Standard Deviation	4.89	1,037.28	595.91	175.83	236.13
Range	38.85	5,175	3,297	969	1,820
Minimum	0.25	365	57.3	30.9	13.1
Maximum	39.1	5,540	3,354	1,000	1,833
Count	139	139	139	139	139
Confidence Level (95%)	0.81	172.44	99.07	29.23	39.26

Overview - The Future of the River

Ralph Adkins, President of the Board
Southeastern Colorado Water Conservancy District

A River of Dreams and Realities -- I think that what you have heard the past two days makes it very clear that it is no longer a dream; it is the reality of what we face right now. The dreaming is over, the hard, dirty work is here, and time is of the essence.

Colorado has a history of conflict over water. When I was growing up in Las Animas, as a boy I can remember when two neighbors got into a fight over water and one of them hit the other in the head with a round-point shovel and killed him. Quite a few years later, there was an incident down on the Purgatoire when the water commissioner was out on the ditch bank with a farmer. Another fellow drove up, got out of his pickup with a gun, and started after the farmer. The water commissioner said at that point he went right over the riverbank without any hesitation. In the chase, the chasee was able to grab his gun and he shot the chasor.

Water has been a matter of many conflicts not just in Colorado but all over the West. I hope that we today have outgrown that. Many of the contests have been resolved by compacts. Colorado is a party to nine of them. We are probably the greatest compacted state in the Union with the Colorado River, the Upper Colorado River, the La Plata, the Las Animas-La Plata, the South Platte, the Rio Grande, the Republican, Costilla Creek, and of course, the Arkansas River.

As we look to the future, we might want to look at the past and see what happened there. Perhaps from what I shall share with you will come some ideas we may be able to use here in the valley as we work to solve our problems with the use of our water, both subsurface and surface. The plans that I will describe have resulted in the conservation and exchange of water among the states on the Lower Colorado River.

In 1993, Secretary Bruce Babbitt approved an arrangement between the Metropolitan Water District of California and the Central Arizona Water Conservation District. Many of you recall the bitter lawsuit between California and Arizona that wound up in the Supreme Court after many years of battling. Under the plan that they worked out, the Metropolitan District will pay Central Arizona to store its unused water in Arizona's underground aquifers. In return, Central Arizona will not divert its Colorado River entitlement in an amount approximately equal to what they have stored underground. Metropolitan will then divert Arizona's unused apportionment at least until the time comes when Arizona will need that water.

Interestingly, California has a statute that allows a user who conserves water to transfer that conserved water for use elsewhere. In 1989, Interior Secretary Mannie Lujan approved a plan whereby the Metropolitan District finances 16 conservation projects in the Imperial Irrigation District. In return, Metropolitan gets the use of 100,000 acre-feet (af) of conserved water for at least 35 years. Cities can afford to pay for such water where farmers cannot, so you can expect to see cities doing more of this in the years ahead.

In Colorado, we have had at least two attempts in the Legislature with bills that have been introduced to do that very same thing. They both went down to defeat. Whether the changing complexion will result in a different approach we will have to wait to see.

Metropolitan Water District has a contract with the Palo Verde Irrigation Distinct under which the farmers who enroll in the plan get a fixed payment for each acre placed in the plan and an extra payment per acre for every year that the plan is exercised. This plan is for 35 years and the farmers continue their irrigation except in the dry years. There has been some suggestion of that here in Colorado and in the valley, and I think it may be something that we will want to look at in the long pull. We may want to give some serious consideration to it in the years that lie ahead.

Water banking is not a new idea. The seven-party agreement of 1931 incorporated into every Secretarial contract with California water users provisions whereby the Metropolitan Water District, San Diego and Los Angeles could bank up to five million af of water saved by diversions reduced below their entitlements. These contracts reserved to the United States the right to enter into the same kind of contracts in other states -- something to think about with our Reclamation projects here.

In 1993 the Metropolitan Water District and Nevada were at the Secretary's door with plans for banking and transfer of water. For various reasons plans have been held in abeyance, and one of the reasons is that Arizona came completely unwound when they heard what California and Nevada were thinking about doing and asking for the Secretary's blessing to do. Keep in mind that the Lower Basin States, particularly California and Arizona, have fought for years over the division of their share of the Colorado River, and Arizona did not sign the Colorado River Compact of 1922 until 1944.

Closer to home, we have the Roan Creek project of the Chevron Shale Oil Company and Getty Oil Company located at Debeque, some 24 miles above Grand Junction on the Colorado River. This project has priority dates that are senior to the Fryingpan project. Those water rights were originally secured for the oil shale industry. With the pullback in activity on oil shale development, the companies are looking for ways to protect their decrees against abandonment. One way is the Roan Creek Project which would lease the water to Nevada in an amount up to 200,000 af for 30-50 years, after which it could be pulled back for use in Colorado.

This raises all kinds of questions: the export statute that we have in Colorado, compact entitlements -- it opens a whole Pandora's box of questions. Backers of the proposal are in court now with a diligence application, and it remains to be seen how it will come out. They are receiving a lot of opposition including the Southeast District, which takes a dim view of that. Many say, 'Why worry? It will never come to pass." But let me remind you that a number of years ago people said that John Elliot was crazy to think that he could pull off the Homestake Project. Ask Aurora and Colorado Springs where some of their water is coming from today.

As many of you are aware, Ruedi Reservoir on the Fryingpan River above Basalt was built as a replacement storage facility to hold water that would allow us to divert to Eastern Colorado when there was a Western Colorado call on the river. This structure was built to hold 100,000 af, with up to 28,000 af for East Slope diversion. The Bureau of Reclamation is now involved in the round two water sales selling the remaining uncommitted water in Ruedi. The Fish and Wildlife Service wants it all for fish, including the water that is committed to us. We are monitoring these actions very carefully to always be certain that our rights are preserved. Eternal vigilance is the price of safety, and nowhere is it more true than for our West Slope decrees.

There is also a 15-mile reach on the Colorado River between Palisade and Debeque where the Fish and Wildlife Service is demanding flows adequate to protect the endangered fish. Ten-thousand af of Ruedi storage has already been committed to the reach, with a second 10,000 af to be available on call. That is one more place where we must protect our rights in the water days ahead, and will explain in part why the Southeastern Water Conservancy District legal costs are as high as they are.

The coming proposed constitutional amendment, which we have mentioned, states:

> *... every director of a water conservancy district shall be elected in a nonpartisan election by a majority of the eligible electors who vote thereon. An eligible elector is one who is otherwise eligible to vote under the laws of this State and who has been a resident of the water conservancy district for not less than 30 days, or who, or whose spouse, owns taxable, real or personal property situated in the boundaries of the water conservancy district whether said person resides within the water conservancy district or not.*

I would recommend that you all get a copy, and when you read it carefully you will realize its impact.

What we now face in the Arkansas River in Colorado is the absolute need to work closely together to abide by the results of the Colorado/Kansas lawsuit and the coming rules and regulations that exist as a result. We cannot afford the kind of conflict that we have had in the past. I can recall when the idea surfaced of having a park along the Arkansas River from Leadville to Pueblo. Quite a few of us said, "No way." We were not about to lose any of our Fry-Ark water to the fish and boaters. But look at what sitting around a table and honestly sharing our concerns has accomplished. Today we are living together, and the upper river has a strong economy built on rafting and boating as well as fishing.

Rest assured that Kansas, having won, will give no quarter in the days ahead as final decisions are made in the lawsuit. Witness the fact that Kansas asked the court for an injunction to stop all pumping until the case is settled. We must work together to bring about the best use of our water with the least injury to our towns and farmers who will be hurt. Some farmers will have to curtail their acreages and some will be forced out of business before this is over. That is a hard fact of life that we may have to face.

In an attempt to make the best of the situation, the Colorado Well Protective Development Association, the Arkansas Groundwater Users Association, and the Lower Arkansas Water Management Association have been formed and are working to solve the problems. CWPDA and AGUA have signed a merger agreement to form one entity above John Martin. They will work with the Southeast District to allocate the District's return flow water and find other water that can be used to make up the consumptive portion of the pumped water.

For a while, at least, it is expected that Pueblo and Colorado Springs will be able to provide some of the make-up water from their surpluses. Over time, as the cities grow, this water gradually will be withdrawn and other means of meeting the need will have to be found. There is some time in this area in which to make the necessary replacements, and it is here that the valley must work together in the closest fashion to meet the needs of our water users.

The same is true of AWMA, located below John Martin Reservoir. It is moving aggressively toward the goal of meeting the usable state line flow requirements, and I think doing a fine job in that direction.

We have come a long way, and I think the Arkansas River Coordinating Committee was a tremendous move in the right direction to bring us together here in the valley to look at the common problems that we face. It will continue to be of help in the days ahead. We can, working together, solve our problems with the least possible hurt to the economy of the valley. To do this will require a much more comprehensive level of administering water rights in the valley. Every well and every headgate will have to be known to the water officials, and it is at that point that I think we have our greatest concern. The key to this whole plan to meet our usable state line flow requirements will be the administration of the rules and regulations. We must have the cooperation of every pumper in the valley as well as the surface people if we are going to accomplish this. It is good to know that the power companies have indicated a willingness to make the pump records available, which will greatly assist in the administration process.

Time is of the essence, and I urge that all of us move as rapidly as possible to solve these problems so we give no opportunity for Kansas or Judge Littleworth to even think about placing a federal river master on the Arkansas River. We must continue to guide our own destiny.

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