

Follow-up Questions for the Record
Select Committee on Energy Independence and Global Warming
Oversight Hearing
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- 1. Assuredly, there will be environmental concerns associated with any new surface water storage projects. In your opinion, is it possible to address those issues and move forward with storage projects that will ultimately have broad support from a number of different stakeholders?**

Response: Yes. Individual surface storage proposals must be evaluated and the associated benefits and risks must be viewed in a net, comprehensive manner. While some environmental groups focus on perceived negative impacts associated with new facility construction (e.g. loss of habitat, disruption of “natural” stream flow patterns, and potential evaporative losses), these perceived impacts must also be compared to the wide range of multi-purpose benefits that storage projects can provide. Properly designed and constructed surface storage projects provide additional water management flexibility to better meet downstream urban, industrial and agricultural water needs, improve flood control, generate clean hydropower, provide recreation opportunities, and – yes, create additional flows that can benefit downstream fish and wildlife species.

Some people and organization oppose dams as a matter of dogma. They have no flexibility when it comes to surface storage. But experience teaches us that solving complex problems requires a great deal of flexibility. It also requires the collective efforts of reasonable, well intentioned people who may come at the problem from entirely difference perspectives. Surface storage isn’t the solution in all cases, but dismissing it out of hand serves no good purpose.

Creative, successful solutions can be found by motivated, unthreatened parties. Incentives that create reasons to succeed will do more good for the environment in a shorter period of time than actions that rely on threats of government intervention.

- 2. Have conservation efforts been effective in reducing water demand or have increases in population in the West negated the savings from conservation?**

Response: Conservation efforts have been effective, but it strains credibility to believe that conservation alone will supply enough water for the tens of millions of new residents expected to arrive in Western cities during the coming decades. Also, conservation does not work in many cases, especially where the desire is to increase in-stream flow. Water that is conserved tends to be used by the next junior downstream appropriator and the flow remains the same.

The report¹ I submitted for the record at the July 10 hearing provides several examples from throughout the West, where creative measures have been taken to develop and efficiently manage water resources for irrigation. These examples represent just a handful of the creative water management programs that Western irrigators are working on. Efforts to conserve water in urban areas have also been impressive, particularly in the Southwest.

In Las Vegas, description of a specific experience may provide the best response to this question. The Southern Nevada Water Authority (Authority) has imposed dramatic conservation measures in the urban areas around Las Vegas. Consider the following:

- ☞ As of March 2006, a program developed to pay customers \$1 per square foot to remove lawns had already spent \$56 million.
- ☞ New restrictions were imposed on landscaping.
- ☞ Use of recycled water was stepped up dramatically.
- ☞ Casino-hotels along the Las Vegas Strip have made significant investments in water features, capturing and treating grey water and using recycled water.
- ☞ A stiff four-tier rate structure was imposed, as were high connection charges.

With conservation measures in place, southern Nevada reduced water use by 65,000 acre-feet in two years. However, despite these aggressive conservation actions, the Authority is moving with equal determination to develop new water supplies in other parts of the region, since probabilities of shortages on the Colorado River are likely going to increase over time. As noted in our written testimony, the Authority is already planning to take groundwater out of aquifers under the Utah-Nevada state line and pipe it to Las Vegas.

So, this particular example – which describes some of the most innovative and aggressive conservation measures undertaken in the West – suggests that even the highest level of conservation is insufficient to keep up with new demands caused by new residents moving to Las Vegas.

3. How do you see technology assisting adaptation efforts to climate change? For example, are you aware of any projects being developed right now that will help manage water supply and increase crop resiliency?

Response: Technology has and will continue to play a role in assisting adaptation efforts to climate change. Recent advances in water measuring technology, weather modification and the use of GIS to better manage complex water systems are three such examples. I will elaborate on one other important area where technology is already impacting crop resiliency.

¹“Water Supply in a Changing Climate: The Perspective of Family Farmers and Ranchers in the Irrigated West”, Family Farm Alliance, September 2007

Of the inputs crucial to growing a healthy crop, water is among the most important. Plants improved through today's biotechnology traits are already providing environmental mitigation benefits. Research is honing the next-generation of biotechnology traits aimed directly at improved drought stress tolerance. Such biotech benefits --potentially available in corn, cotton and oilseeds -- may boost yields under reduced moisture levels or allow increased performance with additional water application, helping to alleviate pressure on limited water supplies.

Unfortunately, the environmental movement has been very proactive and creative in its opposition to the genetic modification of food. It successfully made the erroneous connection in the public's mind between genetically engineered foods and chemical manipulation, even though genetic engineering has nothing to do with chemicals and is in fact an organic science that uses the same processes that nature uses to evolve species. Genetic engineering of foods is about improving nutrition, increasing productivity of farms to reduce conversion of native lands, improving health benefits of food, and reducing the use of chemical pesticides.

4. Do you agree that any mandatory cap on greenhouse gas emissions must include rapidly developing countries, specifically China and India?

Response: The Family Farm Alliance focuses on water issues directly associated with Western irrigated agriculture, and we have not taken a formal policy position on this matter. Other witnesses who testified at the July 10 hearing may be better qualified to respond to this question.

5. Do you support nuclear energy as a source of carbon-free electrical generation?

Response: Please see response to #4, above.

6. What can my home state of Missouri and the Midwest in general look forward to (in regards to extreme weather) in the coming decades as a result of increased temperatures due to climate change?

Response: Please see response to #4, above. The Family Farm Alliance membership spans 17 Western states. Unfortunately, our membership does not include water users in Missouri or other Midwest states. Our 2007 climate change report did identify likely impacts to hydrology in Western states, and those impacts are summarized in my written testimony.

7. We have all seen the devastation caused by Hurricane Katrina in New Orleans. Sometimes urban areas are more vulnerable to extreme weather events, due to the high density of people and structures. What can cities expect in terms of extreme weather?

Response: In our work on climate change in the West, we have not focused specifically on cities, but rather, the agricultural sector. However, in general, as noted in our testimony, we can expect to see the following general effects and impacts caused by warming future temperatures in the Western U.S.:

- Smaller snow packs and earlier snowmelt will affect reservoir storage and demand for water and impact productivity and value of hydroelectric generation;
- More rain than snow is likely, with uncertain projected impacts to overall precipitation amounts in specific areas;
- Extreme flood events could be more common and larger, posing a potentially greater threat to urbanized areas.
- Droughts and higher temperatures would be more intense, frequent and last longer, which would increase stream and reservoir evaporation, diminish surface water supplies, and stress groundwater supplies and water quality.

Despite the highly variable and uncertain nature inherent with climate change predictions, it can safely be concluded that, in the West, with a warming climate, there will be less water stored in our biggest reservoir...the snow pack.

8. How can cities – like my hometown of Kansas City, Missouri – prepare for an extreme weather event, in terms of evacuation plans and emergency shelters?

Response: Please see response to #4, above. The Family Farm Alliance membership spans 17 Western states. Unfortunately, our membership does not include water users in Kansas City, and thus, we are not prepared to address extreme weather events associated with that locale. We also generally focus on water supply, rather than flood control, matters. We support a general philosophy that the best decisions on water issues are made at the local level.

9. Since climate change has been linked to intense weather events, how can cities help to avoid incidents of extreme weather?

Response: Please see response to #4, above. Our involvement with climate change issues has not delved into impacts on cities, since our membership consists of agricultural water users.

10. Would the increased farming – like the recent increase of biofuels – in this country have any effect on extreme weather events?

Response: We are unaware of any information or study that directly links increased farming with extreme weather events. On the contrary, our 2007 report cites new research that suggests Western irrigation has kept croplands cool, essentially countering rising temperatures caused by greenhouse gas emissions over the last half century². That impact may be compounded by the predicted decreases in water available for agriculture in the future due to climate change. This, in turn, would cause more reductions in water supply, which would further restrict irrigation.

² Kueppers, L. M., M. A. Snyder, and L. C. Sloan (2007), Irrigation cooling effect: Regional climate forcing by land-use change, *Geophys. Res. Lett.*, 34, L03703, doi:10.1029/2006GL028679.

11. What can Congress do to mitigate the effects of global warming, in an attempt to reduce the chances of extreme weather events?

Response: We recommend an adaptive approach to dealing with the uncertainties of climate change. Even if current efforts to mitigate for greenhouse gas emissions are successful, the climate is still predicted to warm considerably over the next several decades, which will have impacts on water supplies and water users.

Family Farm Alliance President Patrick O'Toole of Wyoming last year testified before the Senate Energy and Natural Resources Committee on S. 2156, the SECURE Water Act, sponsored by Senators Bingaman and Domenici. This legislation includes water science initiatives; water efficiency programs; and additional actions that will help us adapt to the water-related impacts of global climate change. These provisions closely match similar recommendations in our 2007 report. While there is not currently a companion bill introduced in the House, the Alliance would encourage the House to take up a similar bill to help speed its enactment into law.

12. Could you clarify your point with specific examples regarding the vulnerability of Midwest farming households to the variations in climate that you described in your testimony?

Response: Our written testimony did not mention vulnerability of Midwest farming households to the variations in climate, since our membership spans the 17 Western states. As noted above, however, we can expect to see the following general effects and impacts caused by warming future temperatures in the Western U.S.:

- Smaller snow packs and earlier snowmelt;
- More rain than snow;
- Extreme flood events; and
- Droughts and higher temperatures.

Our report summarizes how these general impacts are projected by certain studies to be manifested in specific regions of the Western United States. In Western areas that rely on melting snowpack from mountainous areas, in general, more water in the form of rainfall and runoff will come at farmers and ranchers sooner in the season, when it may not be useful and may even present a threat.

For example, snowpack in the Cascade Range holds two-thirds of the region's stored water. As it melts during the dry summer months, it fills rivers, generates hydropower, and helps meet the water needs of irrigation, fish, recreation and growing urban areas. But, some experts say that Cascade snowpack has diminished in the past fifty years and is expected to further shrink. If this

is the case, projected warmer winter temperatures could cause snowpack to melt earlier in the spring, which could exacerbate both spring-time flooding and late-summer drought conditions.

13. In a warming world, we have been told that the conditions that favor summer heat waves will become more frequent. What are your thoughts on what we can do to protect those in our inner cities who are least capable of protecting themselves and are therefore more vulnerable to these types of conditions?

Response: Please see response to #4, above. Our involvement with climate change issues has not delved into impacts on cities, since our membership consists of agricultural water users.

14. Are there currently any options available to expand hydropower and water storage?

Response: Yes. Two recent studies support this answer.

The Board of Directors of the Family Farm Alliance in 2005 launched a project that pulled together a master data base of potential Western water supply enhancement projects. Our goal was to gather together ideas from around the West and put them into one master data base.

The types of projects contained in the resulting *Western Water Supply Enhancement Study* database are not monstrous dams like China's Three Gorges project. Instead, they are supply enhancement projects that range from canal lining and piping, to reconstruction of existing dams, to integrated resource management plans. There are also some very feasible new surface storage projects. The benefits from these projects include providing certainty for rural family farms and ranches, additional flows and habitat for fish, and cleaner water. There are over 100 projects included in our data base.

Shortly after the Alliance's data base was released (and submitted to the Congressional record in April 2005), the Bureau of Reclamation seven months later submitted a report to Congress that identified nearly one thousand potential hydroelectric and water supply projects in the Western United States that have been studied, but not constructed. The report was required by the Energy Act of 2005.

The 2005 Alliance and Reclamation efforts show that, in most areas of the West, water resources are available to be developed. Environmentally-safe and cost-effective projects exist. They await the vision and leadership needed to move them to implementation.

What can be done to counteract smaller snow packs and less spring runoff?

Response: A recent Western Governor's Association report and other studies suggest that more spring runoff, coming off the mountains in a shorter time period, is the general predicted impact associated with climate change. Water resources experts throughout the West realize that new

surface water storage projects may be necessary to capture more rapidly melting snowmelt or water from other sources.

There are several reports that suggest existing reservoirs will not be capable of safely accepting the earlier, more intense snowmelt. A report released two years ago by the State of California predicts that climate change will result in a drastic drop in the state's drinking and farm water supplies, as well as more frequent winter flooding. The report suggests that warmer temperatures will raise the snow level in California mountains, producing a smaller snowpack and more winter runoff. This means more floodwaters to manage in winter, followed by less snowmelt to store behind dams for cities, agriculture, and fish.

Some Western water managers believe there will likely be a "rush" to re-operate existing multi-purpose projects to restore some of the lost flood protection resulting from the changed hydrology associated with climate change. These projects were designed to provide a certain level of flood protection benefits that will be reduced because of more "rain flood"- type of events. There will be a call to reduce carryover storage and to operate the reservoirs with more flood control space and less conservation space. If this is done, it will even further reduce the availability and reliability of agricultural water supplies.

Further, many water users are located upstream of existing reservoirs. These users must then rely on direct or natural that is primarily fueled by snowmelt. In the Rocky Mountain West, snowmelt traditionally occurs during the onset of the irrigation season. Since conveyance systems are never 100% efficient, water is diverted, conveyed and spread on the land in excess of the net irrigation demand. This surplus returns to the stream and recharges groundwater aquifers, which augments water supplies for all users located downstream from the original diversion. If more runoff were to occur during warm cycles in winter before the onset of the irrigation season, this would impact the utility associated with these return flows.

15. How is per capita water usage trending in the West?

We do not have "per capita" water use information at hand. "Per capita" is a term that is generally used when discussing domestic water use, since it provides a sense of the average amount of water an individual would use per day. Agricultural water use – which is the focus of the Family Farm Alliance – is addressed in terms of "acre-feet" of water used per acre of irrigated farmland, number of acres irrigated, etc.

"Per capita" water usage trends have varied throughout the West, as well as throughout the rest of the country, according to location. The Water Resources Division of the U.S. Geological Survey (USGS) is the lead office for this type of information. The USGS publishes a report, *Estimated Use of Water in the United States*, every five years which contains this information. The USGS first conducted the water-use compilations for 1950 and has published them every 5 years since.

To provide a quick sense of how recent USGS reports have characterized irrigation water trends, consider the following. Since 1985, when USGS first collected data on irrigated acres by system type, more acres were irrigated using sprinkler and microirrigation systems than were irrigated with flood systems. The proportion of total acres irrigated using sprinkler and microirrigation systems increased from less than 40 percent in 1985 to 52 percent for 2000. The average irrigation application rate declined about 30 percent, from 3.55 acre-feet per acre during 1950 to 2.48 acre-feet per acre during 2000. The largest declines in application rates occurred after 1980.

For domestic, industrial and other types of water uses, the USGS report contains a multitude of data presented in a myriad of ways. We recommend that you review this report to assess the exact information you are looking for.

16. What options should be on the table to balance the need for water to go to urban settings against the need for agricultural use of water?

Response: We believe that it is possible to meet the needs of cities and the environment in a changing climate without sacrificing Western irrigated agriculture. To achieve that goal, we must expand the water supply in the West. There must be more water stored and available to farms and cities. Maintaining the status quo simply isn't sustainable in the face of unstoppable population growth, diminishing snow pack, increased water consumption to support domestic energy, and increased environmental demands. Conservation measures must continue to be included in the suite of solutions, but it strains credibility to believe that conservation alone will supply enough water for the tens of millions of new residents expected to arrive in Western cities during the coming decades. Water reuse, desalination and temporary water transfer mechanisms should also continue to be employed, but they, too, are not sole "silver bullet" solutions.

A multitude of unique solutions exist for Western communities wrestling with growing urban water use. Unique solutions exist for unique locations. The Northern Colorado Water Conservation District is currently seeking to develop new offstream storage to protect agriculture as urbanization sweeps into Northern's traditional service area. Farmers in the Klamath Irrigation Project (CALIFORNIA / OREGON) are paid through an environmental water bank to temporarily fallow land or pump groundwater in place of using Klamath River water. On the other hand, unsuccessful implementation of Central Valley Project Improvement Act water transfer provisions in California suggests that water markets cannot be legislated.

There is growing recognition that states and local governments must consider the impacts of continued growth that relies on transfers from agriculture and rural areas and to identify feasible alternatives to those transfers. For example, a 2006 report released by the Western States Water Council (WSWC) and Governors Association (WGA) states "there is understandable support for the notion of allowing markets to operate to facilitate transfers from agricultural to municipal and urban use as a means to accommodate the needs of a growing population. While such transfers have much to commend them, third party impacts should be taken into account, including

adverse effects on rural communities and environmental values. Alternatives that could reasonably avoid such adverse impacts should be identified."

The Family Farm Alliance is working with WSWC to develop a report on successful and unsuccessful agricultural-to-urban water transfers to determine how transfers can be accomplished in a manner that avoids or at least mitigates damage to agricultural economies and environmental values, while at the same time avoiding infringement on private property rights. We would be happy to share that report with your committee when it is complete.

17. How much investment do you think is necessary to upgrade irrigation infrastructure to accommodate future water management issues?

Response: According to information provided at an April 2008 hearing conducted by the Senate Water & Power Subcommittee, since 1902, Reclamation constructed a large majority of the water infrastructure that now exists in the 17 Western states. Much of this infrastructure is now 50-100 years old, approaching the end of its design life and in need of substantial rehabilitation or replacement. The original development cost of this infrastructure was over \$20 billion. Reclamation estimates that the replacement value of its water infrastructure is over \$100 billion.

The problem with fixing aging public infrastructure is there are not enough federal dollars to go around for burgeoning repair needs. Yet, in the case of Reclamation water facilities, most of the rebuilding of this federal water infrastructure is paid for by the end users who contract with Reclamation for their water supplies. Reclamation estimates that \$3 billion will be needed from project users in the near-term to provide for essential repairs and rehabilitation of facilities. These costs do not reflect the costs associated with developing new storage facilities and expanded delivery systems to accommodate the growing population, increased environmental water demands, expanding energy water requirements, and climate change. Also – these costs relate only to Reclamation facilities and do not reflect costs of non-Reclamation water users, including private water rights holders, which are numerous.

18. Have you done any work with farmers around the world who currently work with a similar water supply as what you anticipate Western farmers will see?

Response: As an organization, the Family Farm Alliance has not formally interacted with farmers around the world who currently work with a similar water supply as what we expect Western farmers will see. However, many of our individual members have worked with agricultural interests from other countries, particularly Israel. I personally have worked with water managers from Russia and Australia on water conservation and water marketing issues.

19. What policies can the Federal government implement to help preserve farmland?

Response: In the big picture, “preserving farmland” equates to “preserving farmers”, which

means we must find ways to keep farmers and ranchers doing what they do best, and to further encourage young farmers to follow in their footsteps.

Federal funds and other money should be authorized to help local governments protect farmland, analyze ways to keep farmland in production, set up grant programs for local governments and provide technical assistance to farmers. Congress should consider the option to encourage states to lease development rights from farmers to buffer their farmland.

Legislation could also make it easier for aging parents to deed their farms to relatives without paying heavy inheritance taxes.

To achieve these objectives, the U.S. should adopt an overriding national goal of remaining self-sufficient in food production. Policy decisions on a wide range of issues ranging from taxation to the management of natural resources should then be evaluated to be sure they are consistent with that goal.

Are there already some programs available?

Response: Yes. The U.S. Department of Agriculture, Natural Resource Conservation Service has many manuals describing all facets of its programs. Title 440 – Programs, Part 519 - Farm and Ranch Lands Protection Program – is a good place to start to get a sense of current federal programs. The American Farmland Trust has further information on state and local programs in place, intended to protect and preserve American farmland. For example, the state of Pennsylvania already spends about \$30 million a year to buy up development rights from farmers "in perpetuity," so the land will stay agricultural even if it changes ownership. So far, 2,600 farms, with more than 300,000 acres, have been included in the preservation program, but there is a long backlog of farmers who want to join but can't because the state doesn't have enough money. Pennsylvania has also studied the possibility of having the state pay the tab for a farmer's property taxes. These taxes are often onerous and can lead farmers to sell their land for housing or shopping malls. By paying property taxes over a number of years, the state would need less upfront money than the current program of giving a farmer a lump sum for land preservation. That way, more farms could be included.

20. You note the importance of a stable domestic food supply to the United States' national security interests. How diversified is our domestic crop? Are farmers harvesting a broad enough range of crops that we actually have a stable domestic food supply?

Response: The World Agricultural Supply and Demand Estimates (WASDE) report prepared by the Agricultural Marketing Service Economic Research Service and the Farm Service Agency Foreign Agricultural Service provides the data and analysis that would best form a response to this question. These monthly reports estimate supply and demand for wheat, rice, feed grains, oilseeds, cotton, sugar, meat animals, poultry and dairy commodities. The WASDE report can be

downloaded at: <http://usda.mannlib.cornell.edu/>. A free e-mail subscription to the WASDE and other USDA crop reports can be obtained at this same address. For print subscriptions, you can call the National Technical Information Service (NTIS) at 1-800-999-6779 or 703-605-6220. For the remainder of 2008, the WASDE report will be released on September 12, October 10, November 10 and December 11.

21. What sort of role do you believe agriculture should take in a carbon offset market?

Response: The Family Farm Alliance focuses on water issues directly associated with Western irrigated agriculture, and we have not taken a formal policy position on this matter. However, many of our individual members have expressed concern that agricultural representatives become actively engaged on this matter, since there are enormous potential risks and opportunities to agriculture stemming from future policy development in this area.

22. How would streamlining regulatory hurdles assist in developing water management policy? How much do regulations add to the cost of developing infrastructure?

Response: The federal government should adopt a policy of supporting new efforts to enhance water supplies and encouraging state and local interests to take the lead in the formulation of those efforts. The existing regulatory procedures for developing additional supplies should also be revised to make project approval less burdensome. By the time project applicants approach federal agencies for authorization to construct multi-million dollar projects, they have already invested extensive resources toward analyzing project alternatives to determine which project is best suited to their budgetary constraints. However, current procedure dictates that federal agencies formulate another list of project alternatives which the applicant must assess, comparing potential impacts with the preferred alternative. These alternatives often conflict with state law. Opportunities should be explored to expedite this process and reduce the costs to the project applicant.

The example of the permitting history of the Little Snake River Irrigation Water Supply Project, High Savery Dam and Reservoir (Attachment 1) best illustrates this matter.

In addition, the current mitigation procedure for federal agencies should be reviewed to determine the feasibility of clarifying and standardizing mitigation requirements. Currently, requirements for one project become the standard for all subsequent projects. Since no two projects are the same, federal agencies tend to impose increasingly severe mitigation requirements on new projects. The end result is that applicants end up spending tremendous amounts of money for potentially uncertain mitigation.

The example of the city of Buffalo, Wyoming (Attachment 2) illustrates the point. For 8.8 acres of wetlands impacts, the cost of mitigation amounted to approximately \$1 million. This is in excess of \$100,000 per acre. The primary reason for these costs was that the United States Army Corps of Engineers required a 5:1 ratio for wetland mitigation. The 5:1 ratio is not a

scientifically based figure, but rather an arbitrary figure developed by the agency. After 3 years and significant expense, the city finally was forced to accept this ratio in order to proceed with the project.

23. Can you provide some specific examples of the water supply enhancement projects that the Family Farm Alliance has looked at to make up for streamflow losses?

Response: Yes. As noted above, the Western Water Supply Enhancement Study we released in 2005 was transmitted in the form of a CD-ROM. The database that was generated from the compilation of our survey has a Global Information System (GIS) element and includes pictures, maps and a description of up to 500 words for each project or proposal. New GIS format technology is embedded that permits viewers to see a map of 17 Western states and then "drill down" to see map details of a project area.

There are over 100 projects included in our data base. Some specific projects include:

- **Atterberry Irrigation Reservoir (Washington)** is a small proposed project that involves construction of an irrigation water reservoir (500 acre-feet) which would reduce irrigation water withdrawal from the Dungeness River during periods of low streamflow. The project will provide substantial increases in available side channel spawning/rearing habitat as well as reduced water temperature benefits.
- **Plateau Reservoir (Colorado)** would be operated in conjunction with McPhee Reservoir to improve downstream fishery habitat. The Dolores Water Conservancy District (DWCD), Bureau of Reclamation, State of Colorado and Federal fishery agencies have identified the need to provide at least 3,300 acre-feet per year of additional water for the fishery flow downstream of McPhee Reservoir. McPhee Reservoir and related delivery facilities are part of the Dolores Project, a multi-purpose water storage project that supplies water for irrigation, municipal, fishery below the dam, and other uses. The fishery downstream of McPhee Dam is an excellent cold water trout fishery. DWCD has been studying methods to provide the additional fishery water and has identified the construction of Plateau Reservoir as an option to supply additional fishery water.
- **Viva Naughton Reservoir (Wyoming)** is one of several alternative storage sites under investigation on the Hams Fork River above Kemmerer. The recent drought has greatly changed the water agreement between downstream irrigators and PacifiCorp, the owner of Viva Naughton Reservoir. Investigations completed for the Green River Groundwater Recharge and Alternate Storage Study published in late 2001 indicate enlarging Viva Naughton Reservoir is one of the more efficient water development projects in the state. The permitted enlargement of Viva Naughton Reservoir would provide a much needed source of late season water for users below the dam.

- **Sites Reservoir (California)** has been identified by the Department of Water Resources and the CALFED Program as one of the most cost-effective and environmentally beneficial new facilities under consideration in California. The Sites project would enhance water supply reliability for environmental, urban and agricultural uses throughout the state. It would provide water supplies in average and dry years for urban, agricultural and environmental purposes, increase San Francisco Bay-Sacramento / San Joaquin Delta outflows during critical times, improve flood control, enhance groundwater recharge, bolster fish flows, and improve flexibility for existing projects, such as Shasta Reservoir. Sites reservoir can greatly increase reliability of water supplies by reducing water diversions on the Sacramento River during critical fish migration periods.
 - **Strawberry Valley Rehabilitation and Betterment Projects (Utah)** are proposed to decrease the water seepage and losses in the Strawberry Valley Project, as well as provide gravity pressure for the continued migration toward sprinkler irrigation systems, which would then provide additional water savings. These projects could save approximately 15,000 to 20,000 acre-feet of water per year in an agricultural area that is rapidly urbanizing.
 - **Temperance Flat Dam (California)** would be a new structure constructed on the San Joaquin River, above Friant Dam, which would provide much needed water supplies and hydroelectric power. The Upper San Joaquin River Basin Storage Investigation was completed by the U.S. Bureau of Reclamation, in cooperation with the California Department of Water Resources, consistent with recommendations in the CALFED Bay Delta Program Record of Decision.
 - **Teton Dam Re-Construction (Idaho)** would replace Teton Dam, which failed in 1976 just as it was completed, causing massive flooding in the Rexburg, Idaho, area. Fremont-Madison Irrigation District is considering participating in a reconstruction of this dam, which, in 1990, was estimated to cost \$168 - \$265 million. The project would yield 41,000 acre-feet of water to benefit the fishery, 24,000 acre-feet for trumpeter swans, and 20,000 acre-feet for irrigation.
 - **Water for Irrigation, Streams, and Economy Project (WISE - Oregon)**, is a collaborative effort in Oregon to improve the health of the Little Butte Creek and Bear Creek systems and increase the effectiveness and efficiency of local irrigation districts. The WISE Project utilizes a combination of strategies including: piping and lining canals, increasing the storage capacity of selected reservoirs, and installing a pumping system that will provide access to water that has been allocated for agricultural purposes. Collectively, more water will be available for management for irrigation and environmental instream purposes.
- 24. In addition to streamflow losses, increasing temperatures and a drying climate will likely dry rangelands and have other negative impacts to agriculture. This industry**

is already stressed. What is your sense of the future of agriculture in the West – do the opportunities outweigh the challenges or do you have concerns about the long-term viability of family farms?

Response: As the West has grown, water issues have become increasingly polarized. We face a number of challenges in the Western water arena, but they can be addressed by thoughtful, motivated and reasonable parties. Growing urbanization in the West has placed heavy demands on water, the key ingredient in the production of agricultural products.

This conflict can be characterized in simple terms. Some argue that irrigated agriculture in the West uses too much water; that our rivers are over-committed; and that the environment is suffering. Others insist that a healthy rural economy is driven by farmers and their production of food. Taking water from farms and giving it to cities and the environment will do harm to the fabric of the rural West.

Inaction in this regard really is action. By not seeking creative ways to streamline the regulatory process associated with repairing existing and creating new water infrastructure, the action that will follow is a continuation of the status quo. That action will push water-short cities and new environmental water demands to pursue water supplies from agriculture. In addition to adverse socio-economic impacts for rural communities, that action will significantly diminish domestic food production at exactly the same time global warming is predicted to severely adverse impact food production worldwide.

We must begin to plan for that now, and not wait until we are forced to make decisions during a crisis.

The Family Farm Alliance believes that it possible for the West to find balanced solutions to these conflicts. The solutions will not come easily. They will require visionary leadership and a firm commitment to a balanced, workable policy. But opportunities exist, if we are prepared to seize them, conflict will be reduced and certainty increased.

Attachment 1: Permitting History of the Little Snake River Irrigation Water Supply Project High Savery Dam and Reservoir

Introduction

Permitting is a major step in any project that requires federal agency action; it can be the most perplexing and confusing step in project development. Projects requiring federal actions must go through the National Environmental Policy Act (NEPA) assessment process, which in itself is not a permitting process but is of utmost importance concerning whether required permits will eventually be issued. Due to extensive/thorough NEPA screening requirements and alternative evaluations, projects often lose direction and focus during this process.

NEPA was enacted in 1969 to promote informed decisions and public disclosure of federal actions. Through NEPA assessments other laws such as the Endangered Species Act, Clean Water Act, Fish and Wildlife Coordination Act, and the National Historic Preservation Act come into play. These laws and acts require permits or clearances from a number of agencies, and make coordination of the NEPA process the driving force for project permitting. This was especially true for the Little Snake River Irrigation Supplemental Water Supply Project.

The following sections discuss major events that occurred during permitting of the Little Snake River Irrigation Water Supply Project and present conclusions and lessons learned from this process. The history and conclusions presented are a compilation of information from legislative reports, project studies and personal recollections.

History

The Little Snake Irrigation Water Supply Project began as the Sandstone Dam Project and now is commonly referred to as the High Savery Dam and Reservoir Project. The Sandstone Dam Project began as mitigation for the Cheyenne Stage I, II and III projects and to provide additional water storage for industrial development. The Wyoming Legislature authorized the Cheyenne Stage I and II projects in 1979 and 1980 and also instructed the Wyoming Water Development Commission (WWDC) to look at the feasibility of developing storage in the Little Snake River Basin to address in-basin agricultural, recreational and municipal needs.

Studies were initiated to evaluate dam and reservoir sites in the basin and the Sandstone site was selected as the preferred site. In 1984, the legislature authorized a project in the Little Snake River Basin to mitigate and alleviate any water supply shortages caused by the Cheyenne Stage I and II projects. Sandstone Dam was to impound 52,000 acre-feet of water behind a 200-foot high structure. The reservoir would have had a 32,000 acre-foot annual yield with 12,000 acre-feet allocated for irrigation and 20,000 acre-feet allocated for future industrial development.

After several years of study, the permitting process for the Sandstone Project was initiated in 1986. An application for a Clean Water Act, Section 404 Permit (404 Permit) was filed with the U.S. Army Corps of Engineers (Corps), which initiated the NEPA assessment process. The project was of a scale that an environmental impact statement (EIS) was necessary; the Corps was the lead agency for the NEPA review and for preparation of the EIS. The draft EIS and biological assessment (for assessment of impacts to endangered species) were published in January 1988. Six action alternatives and the no action alternative were evaluated. The six action alternatives included four reservoirs, a ground water development alternative and a water conservation alternative. The preferred alternative, for the state and the sponsor, was the Sandstone Dam and Reservoir Project. All of the alternatives were sized to allow storage of 12,000 acre-feet of irrigation water and 20,000 acre-feet for future industrial development. A supplement to the Draft EIS was published in April 1989 to support need for storage of 20,000 acre-feet for future industrial use. Work continued on the EIS process during 1989 and 1990.

On December 14, 1990, the WWDC received notice from the Corps' Omaha District Office that they were recommending denial of the 404 Permit for the Sandstone Project. Their denial was based upon the lack of an acceptable federal "purpose and need" for the 20,000 acre-feet of water reserved for industrial purposes. The WWDC and then Governor Sullivan disagreed with the decision and requested that the permit be issued. The decision was elevated to the Corps Division Engineer. In 1991, the WWDC was notified that the Division Engineer upheld the District Engineer's recommendation that the 404 Permit be denied for the 52,000 acre-foot project. However, the Corps noted that it would be prepared to reopen consideration of the application if use of the reservoir yield could be clearly defined.

During 1991, the Little Snake River Basin Planning Study was authorized by the WWDC and legislature. This study was completed in October 1992. One task of the study was to evaluate potential reservoir sites to determine whether any were capable of meeting the supplemental irrigation water needs in the Little Snake River Basin. At the request of the Savery-Little Snake Water Conservancy District (District), a downsized version of the Sandstone Project was included among the alternatives.

The Commission recommended construction funding for a smaller Sandstone Dam and Reservoir project; this downsized version would possess a water storage capacity of 23,000 acre-feet, which would yield 12,000 acre-feet per year of supplemental irrigation water. Legislation was approved during the 1993 session to provide \$30,000,000 to construct the project. The project purpose, as defined by the legislature, was to serve as an agricultural, municipal and domestic water supply; the project was to also increase recreational opportunities, provide environmental enhancements, and serve as mitigation water for shortages caused by the Cheyenne Stage I, II, and III trans-basin diversion water supply projects.

Additional studies were conducted in 1993 to determine the suitability of the Sandstone site. The report concluded dam construction at the Sandstone site was technically feasible. In 1994, the WWDC began the permitting process for construction of a smaller project, including a

downsized Sandstone Dam and Reservoir project and several other potential alternatives. The downsized Sandstone Dam was the preferred alternative. Since the scope of the project had changed, the results of the draft EIS published in 1988 could not be used. The WWDC entered into an agreement with the Corps and contracted with Burns and McDonnell to complete a new third party EIS.

The Corps advised the WWDC, District and valley residents in January 1995 that a 404 Permit could be issued only for the least environmentally damaging alternative. That summer the Corps indicated that the least damaging practicable alternative was a combination of two alternative reservoirs (Dutch Joe and Big Gulch); therefore, a 404 Permit would not be issued for the Sandstone Dam alternative. The Corps had narrowly defined the purpose and need for the project as supplemental late season irrigation water supply. The Corps' definition conflicted with the Wyoming legislation that authorized funding for the project; the Wyoming Legislature stipulated that recreation, environmental enhancement, municipal water supply, supplemental irrigation, and mitigation for past and future trans-basin water projects were all legitimate purposes for the project.

In August 1995, the WWDC director and project manager explained to the WWDC and Select Water Committee of the Wyoming Legislature reasons why the EIS was stalled, which was largely attributable to the lack of support for alternatives other than the Sandstone site. The WWDC and the Select Water Committee concluded that alternatives to the Sandstone Dam and Reservoir should be considered if there was a clear consensus of support for other alternatives. Public meetings were held in the Little Snake Valley in August, October and December 1995 for the purposes of discussing project alternatives. It was apparent that a majority of those attending the meetings preferred the construction of Sandstone Dam, since they believed that the Sandstone site would provide more multiple use benefits than the other alternatives. This majority also disagreed with the Corps decision not to include other project purposes, which were mandated by the legislature, within the Corps' purpose and need analysis.

The WWDC supported the position expressed by a majority of the Little Snake Valley residents and directed the WWDC staff to further pursue changing the purpose and need section of the EIS to include state legislature's mandated purposes, particularly recreation. The lack of agreement between the state and the Corps, concerning the project's purpose and need, resulted in further delay of the project.

In 1996, The WWDC contracted with Burns and McDonnell to complete an analysis of need for additional flat-water recreation in the Baggs, Wyoming area. The study concluded that there wasn't a need for additional flat-water recreation in the area. Other studies were commissioned to keep the project moving forward; but study results also did not support the Sandstone alternative. The Corps reaffirmed their position that the project purpose could only be for supplemental irrigation water supply. Further, the Corps indicated verbally and in writing that the project should provide 12,000 acre-feet of water on a firm basis 8 out of 10 years. The

Savery-Little Snake River Water Conservancy District had requested a firm 12,000 acre-foot yield 10 out of 10 years.

Adding to other problems, the Sandstone Dam alternative was the most costly project (about \$48 million). The Dutch Joe alternative was nearly \$10 million less costly. The High Savery alternative was the least costly at about \$30 million. Environmental impacts were greatest at Sandstone but appeared to be significant at the Dutch Joe and High Savery sites as well. A meeting to discuss the project, attended by representatives of the Corps, other federal agencies, several state agencies, the Governors' office, representatives from the District, other representatives from Carbon County, the WWDC, and the Select Water Committee, was held on November 19, 1996. The Corps stated that given the available data, the Sandstone site could not be permitted because the Dutch Joe site was the least environmentally damaging alternative. They indicated that the High Savery Project might be permitted if it could be shown that impacts to big game winter range at Dutch Joe were more environmentally damaging than the wetland and stream channel impacts at High Savery. A meeting was held in Baggs on December 5, 1996 and the irrigators and Little Snake Valley residents supported a motion to change the project name from Sandstone to the Little Snake Water Supply Project. Work completed in 1995 and 1996 resulted in a delay to the project but set the stage for the eventual construction of the High Savery Dam and Reservoir alternative.

The permitting process was put back on track in 1997 and three alternatives were selected that would meet the specified need for the project, which was to supply 12,000 acre-feet of supplemental irrigation water to the users in the Little Snake River Valley 8 out of 10 years. The alternatives studied were a downsized Sandstone Dam and Reservoir, Dutch Joe Dam and Reservoir, and High Savery Dam and Reservoir. High Savery became the preferred alternative. The final studies were completed during 1997 and 1998 and the Draft EIS was published in August 1998. The Fish and Wildlife Coordination Act report was also released in August 1998.

Public meetings were held and comments were taken on the draft EIS in the fall of 1998. Disagreements between the WWDC, the WGFD, the U.S. Fish and Wildlife Service and the Corps on how best to address the DEIS comments delayed the completion of the Final EIS until October 1999. The U.S. Fish and Wildlife Service issued the Biological Opinion in July 1999 to satisfy the consultation requirements of Section 7 of the Endangered Species Act. In order that a Record of Decision (ROD) could be issued, work began in earnest in 1999 to mitigate the project's adverse environmental impacts. Numerous meetings were held with the Wyoming Game and Fish Department, WWDC, USFWS, Savery-Little Snake Water Conservancy District and Corps to resolve differences and finalize the plan.

The Final EIS, completed in October 1999, identified the High Savery Project as the preferred alternative. Several comments were received but none were significant. These few comments were eventually addressed in the Corps' Record of Decision (ROD). However, the project was further delayed because the Corps was concerned about issuing the ROD and 404 Permit before cultural resource preservation and management issues were resolved.

Efforts to comply with the National Historic Preservation Act, which protects cultural resources, were also underway at this time. A number of site visits, conference calls, and meetings were conducted to discuss cultural resource issues with interested Native American Tribes, the Wyoming State Historic Preservation Office (SHPO), WWDC and the Corps. There were a variety of tasks undertaken to satisfy the requirements of the Tribes and SHPO. Several cultural sites had to be evaluated and protection plans developed. One site required excavation and interpretation. This work was conducted during 1999 and 2000. A final Programmatic Agreement to protect and manage cultural resources on the High Savery Site, which took over a year to negotiate, was eventually signed in early December 2000.

The plan to mitigate the adverse impacts to wetlands, uplands and riparian areas proved to be extremely controversial, which further delayed the project. Three drafts of the plan were completed and debated by all parties involved. In October 2000 a final draft plan was presented to the Corps by WWDC. This plan was finally approved in December 2000 after a meeting with the Corps at their District headquarters in Omaha, Nebraska.

The ROD was issued December 14, 2000, approximately one-year and two months after the final EIS was released. The 404 Permit for High Savery Dam and Reservoir was signed December 20, 2000. These steps completed the permitting portion of the project and advanced the High Savery Project toward construction.

Conclusions and Lessons Learned

It could be concluded from the Little Snake Supplemental Irrigation Supply Project (High Savery Project) history that 14 or more years might be required for permitting reservoir projects. However, that may not be correct. During the time the High Savery Project was being permitted several other reservoir projects within Wyoming were designed, permitted and constructed. Sulfur Creek Reservoir Enlargement near Evanston was initiated in 1984 and constructed in 1986. Design of the Twin Lakes Enlargement for the Sheridan water supply was started in 1988, permitting was begun in 1992, and construction started in 1996 and was completed in 1998. A 404 Permit application was submitted for the Tie Hack Dam and Reservoir Project above Buffalo in February 1994, the permit was issued in March 1996 and the project was completed in 1997. A 404 Permit application was filed in November 1996 for the Greybull Valley Dam and Reservoir. The permit was issued in June 1998 and the project was completed in 2000.

We often learn more from mistakes than we do from successes; in this regard there are a number of lessons that can be gained from the Sandstone/Little Snake Supplemental Irrigation Water Supply Project/High Savery Dam and Reservoir permitting process. The determination of purpose and need under federal guidelines restricts planning opportunities and purposes for which a project may be permitted. The state's acceptance of a project that yields less than a firm supply should be questioned. This acceptance results in less utility for the state and for the project's beneficiaries. A better approach would be to maximize the basin's available hydrology

or at least meet the firm-yield requirements of the sponsor. If the basin hydrology cannot provide the firm yield, the decision to construct the project should rest with the state and sponsor and should not become a reason for permit denial by the Corps. Further, the state should encourage its Congressional delegation to sponsor legislation that would allow the state's legislative and planning process to be considered in establishing purpose and need for construction of dam and reservoir projects.

If Congress is unwilling to expand the state's role in establishing the purpose or need for a project, the project sponsor and the state must work within existing guidelines to maximize opportunities. Working within either existing or expanded federal guidelines would facilitate the NEPA analysis, from which all other permitting processes will tier. The 20,000 acre-feet of water storage for future industrial development that couldn't be definitively described in the early Sandstone Project was a permitting problem. There was no specific purpose or need described for the 20,000 acre-feet of industrial water. Therefore, the Corps felt that justification for building a reservoir having this extra capacity and additional adverse environmental impact was unwarranted. However, it is incumbent on the state and potential project sponsors not to lose sight of future demands for water that may only be addressed by constructing new dam and reservoir projects. The challenge will be to convince regulators, during the permitting process, that the benefits of constructing a proposed future project outweigh the adversities; consequently, there is a justifiable "purpose and need" for the project.

Developing a reasonable range of alternatives is also very important in project planning and the NEPA process. Alternatives must meet the need and purpose for the project and must be capable of being implemented. It is important to use the NEPA process to help determine the most appropriate alternative from the set of reasonable alternatives. Although the Sandstone Project started with a set of alternatives the one seriously considered was the Sandstone Dam and Reservoir alternative. When the Corps determined that the Sandstone alternative could not be permitted, the permitting process stalled because other alternatives had not been seriously considered. Even after the project was downsized to match the need, the State, District, and valley residents wanted to maintain the Sandstone alternative as the preferred alternative. This caused permitting delays.

The permitting process did not proceed until a reasonable range of alternatives was developed. Once a reasonable range of alternatives, including the High Savery alternative, was developed, the project moved forward to a conclusion within an acceptable timeframe. In other words, the alternative site and project evaluations undertaken in 1996 put permitting back on track in 1997. The state successfully secured the permit to construct High Savery in December 2000.

Cooperative efforts are important for moving projects through the NEPA and permitting processes. The WWDC and local sponsors should become cooperating agencies in the NEPA process if possible and if not, should be allowed to serve on the project EIS interdisciplinary team. The Corps wasted a great deal of time making decisions on the project and at times seemed unable to make decisions. These delays not only postponed the project, they resulted in

wasted money. Disagreements at the state and local level also contributed to delays, and led to additional costly studies and analyses.

Establishing working relationships with the agencies involved in the NEPA process and permitting is important to keep the project on schedule and to avoid costly delays and disagreements. It is impossible to eliminate all problems associated with permitting dam and reservoir projects, but good cooperation and communications between agencies and groups, with an understanding of each participant's expectations, will help in problem resolution.

Dam and reservoir projects are complex and often controversial, a dedicated local sponsor or project proponent and a documented "purpose and need" are minimum requirements for success. The primary reason the High Savery Dam was permitted and constructed is the persistence and perseverance of the Savery-Little Snake Water Conservancy District and the residents of the valley. The sponsor's and the state's staying power prevailed in the end.

Attachment 2: City of Buffalo, Wyoming Case Study

The example of the city of Buffalo illustrates the enormous difficulties and expense associated with obtaining federal regulatory clearance requisite for constructing even small and non-controversial water projects. The mitigation associated with this project illustrates the unreasonable approaches being taken by federal agencies as a condition of obtaining needed federal permits. Within Wyoming there are rarely two projects which have the same or equivalent mitigation imposed on them. Rather, it appears that as time passes, each new project has more severe mitigation imposed on it that then becomes the standard for all subsequent projects. This mitigation "ratcheting" creates enormous costs and tremendous uncertainty as has been the city of Buffalo's experience.

The Buffalo Municipal Reservoir Project is developing a small municipal supply storage reservoir in the Clear Creek Basin west of Buffalo. Buffalo's existing water supply is diverted from Clear Creek about 6 miles west of the city. After project completion, releases from the reservoir will supplement Clear Creek flow when the direct flow cannot fulfill Buffalo's water supply requirements. The project is being funded in part by the Wyoming Water Development Commission, a state agency.

A Level 11 - Phase I report was completed in March 1989. The report concluded that the preferred development option included a dam and reservoir at the Lower Tie Hack site on South Clear Creek, a tributary of Clear Creek. The recommended reservoir size is 2,425 acre- feet and the estimated cost of the dam and reservoir is \$10,650,000. The reservoir will inundate approximately 60 acres in total, including 8.8 acres of wetlands. In addition, the report indicated that installation of a \$975,000 hydropower generation unit at the downstream end of the city's water supply pipeline could be economically advantageous. The hydropower unit is addressed as a separate project, but construction of both components is required if the total project is to be economically feasible. The report also noted that the feasibility of the project would depend on the successful transfer of Buffalo's existing 1933 water right filing for 1,640 acre-feet from Little Sourdough Creek to the dam site. This transfer was accomplished in 1990.

The process of permitting this facility began in the early summer of 1992. The arduous and expensive process of obtaining final permits was not completed for nearly 4 years. The Forest Service special use permit was issued on February 23, 1996, and the U.S. Army Corps of Engineers Section 404 permit was issued on March 5, 1996. During the course of the nearly 4-year long ordeal, nearly \$1 million was spent in efforts directly related to obtaining the necessary federal permits.

The mitigation for the 8.8 acres of wetlands has cost in excess of \$1 million. The primary reason the costs for mitigation to the City of Buffalo were so high is that the US Army Corps of Engineers required a 5:1 ratio for wetland mitigation. The 5:1 ratio is not a scientifically based figure, but rather an arbitrary figure developed by an individual within the agency. The City agreed to accept the ratio so that they might proceed with their project.