



WATER: Preserving Our Most Precious Resource

FINAL REPORT



Southwest Arizona Futures Forum



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18th Plenary Session:

“WATER: PROTECTING OUR MOST PRECIOUS RESOURCE”

Final Report

September 25th, 2015

7:30-4:00 Yuma Main Library

Introduction

On September 25, 2015, nearly 100 community and student leaders from Yuma County met together in a Southwest Arizona Futures Forum Plenary Session to learn about, discuss and make recommendations regarding the topic, “Water: Protecting Our Most Precious Resource”.

Those gathered heard informative presentations from a distinguished panel of experts and then separated into six breakout groups each led by a Chairperson and a Panel Recorder. Using information gleaned from a research document furnished to each participant, the knowledge gained from the speaker’s panel, and the background each participant brought to the table, the six groups then addressed a series of nine questions designed to elicit consensus statements and recommendations regarding the topic. The Panel Recorders skillfully drafted consensus statements from each panel, which were forwarded in real time to a Report Committee. The Report Committee, working rapidly throughout the day, collated and edited the multi panel statements into a cohesive report of the consensus of the Plenary. This, then, is the Final Report of the 18th Plenary of the Southwest Arizona Futures Forum.

Yuma County’s Current Water Sources and Uses

The primary source for water in Yuma County is the Colorado River. Though groundwater serves as another source, much of the groundwater sources are replenished by the Colorado River. Some areas of Yuma County rely solely or primarily on ground water to meet their needs, particularly in the East County and in smaller towns such as San Luis and Somerton. However, shallow wells are often too salty for use, so wells must generally be dug to 1,000 feet to find usable water. This process is very expensive, and, even then, the quality of water is

minimal. Cities allocated Colorado River water also supplement with these wells, which do not count against the water allocation they receive. Very few farmers utilize groundwater for agricultural production; well water is primarily to meet the needs of residents.

The age and quality of the aquifer may be future concerns, as it is unclear who is responsible for replacing depleted levels. Currently, however, surface irrigation accomplishes this purpose, and, as long as that continues, the aquifer will be fine in the Yuma area. In fact, management of surplus water height in Yuma Valley is one concern with actually too much groundwater. There are large amounts of ground water that are not used that may be pumped and desalinated and used for return flow credits or other purposes.

Another source is reclaimed water. Reclaimed water is an excellent source for certain urban uses. However, the idea of using water that has been through a sewer system on fresh vegetables and food products is currently unacceptable in our society, so this source does not alleviate the demands of agriculture. Currently, use of reclaimed water in Yuma County is primarily limited to parks. Cities such as Lake Havasu have done a good job of encouraging the use of a “dual plumb” system to reuse “grey water,” and these may be examples for our county.

There are many farmers that have the opinion that there is more surface water than just the Colorado River in Yuma County. For example, the Lower Gila sub-basin is in Yuma County, but that water is used upstream rather than allowed to flow down to Yuma.

Using the Colorado River’s water, particularly through a system of dams and diversions, raises other concerns. To best protect the environment and ecology of the river area, enough water must flow into and out of the system. Not all of the water can be used. But environmental issues and agricultural issues are tied together: a healthy environment means healthy agriculture. Some water districts have proposed that unused water remain in the system for environmental use; however, some political powers want to direct unused water to municipal use.

Our wetlands parks and lakes provide environmental and recreational benefits and contribute to both our tourist economy and improved quality of life for Yuma County residents. Our wetlands parks are on a migratory path for birds providing environmental benefits as well as revenue from birdwatchers and other tourists. Environmentally, agriculture, through the water districts, contributes to the protection of environmental species/habitats, as do the other users, such as municipal and tribal organizations. It should be noted that most of the recreation use is not consumptive.

Water quality should also be discussed whenever water conservation is concerned, as we can contaminate the water by moving it. At the same time, we may need to address climate change and evaluate the water sources from rain and snowfall.

In Yuma County, the primary usage of the Colorado River water is for agriculture, particularly farming. We *grow* things with this water that people all over the country and the

world consume and use. Water is also used in commercial industry and by residents of the communities—we should not forget that an important use of water is our everyday, household usage.

Without a doubt, in Yuma County, agriculture is king and gets the lion's share of the allocated water. In particular, agriculture is the number one dollar producer in Yuma County—indeed, it has a dramatic impact on the statewide economy. Most districts' agriculture water is stored in Lake Mead. Districts attempt to use no more than their allocated amount because over-use causes huge cost issues. Often, districts stay well below their allocated amount, but currently they receive no credit for using less. The excess unused allocation is simply transferred to the Central Arizona Project for another community's use. To encourage conservation and resource sharing, there should be an incentive or compensation for using less water. Alternatively, there should be a way to store the unused water within the region for future use. In this same vein, we are presently unable to capture much of the water runoff during the huge monsoon storms, so we should be considering more dams and water storage in our area to supplement Colorado River water.

It is no simple proposition to change the agricultural structure of the county. Converting land from agriculture use in Yuma County hits the economics of the county harder than in other places. Most of the time, when land is taken out of agriculture use in Yuma County, the result is fallow land that lies barren with no other purpose. This is different from other counties with more robust economic alternatives that can convert the land to other uses.

Yuma County's Water Rights and Entitlements and the Impact of Drought Conditions

Yuma's water rights were established under what is known as the "law of the river." This law governs the entitlements to water usage, which becomes of particular concern in times of drought. Even in times of extended drought, it is unlikely that those entities so entitled would be jeopardized by competing rights. However, reallocation of entitlements distribution is a concern, especially in potential crisis or emergency situations. In order to protect the water needs of Southwest Arizona, it is important to remain vigilant in protecting those rights before such a crisis through efficient water use as well as through public education on issues such as food production, food safety and security. This includes educating people of the fact that the Yuma area is the ideal area for the crop production that takes place here, correcting the colloquial misconception that "lettuce in the desert" is a non-sequitur. Awareness is very important—every area in our state is fighting to protect its water rights and meet its needs, but without understanding all the implications of water use, informed decisions cannot be made. We need to educate and may need to point out the fallacies through the use of technology. Southwest Arizona should be telling everyone how we are doing things better with water in Arizona than any other place—Southwestern Arizona is doing an excellent job when it comes to water usage and efficiency. But we can do even better.

Fear for water supply in the Southwestern Arizona also results from the simple fact of logistics: water must travel 300 miles from Lake Mead to Yuma. If up river entities take water out, it follows that water will not make it down river. Las Vegas' new infrastructure causes concern, as it can drain water from Lake Mead even on low supply years. Recently, Las Vegas has created new precedent in selling unused water to California rather than releasing it. Originally, the fundamental idea was that water rights permitted the use of that water by the beneficiary of that right. If less water was needed, the excess water was utilized by someone else. In times of drought the value of Yuma's entitlements increases significantly and becomes a topic of considerable interest from investors. This raises the issue of composition of irrigation board members and their motivation or interest in considering selling these entitlement rights.

Under the law of the river, California and Nevada have first priority for 4.4 million acre-feet and 300,000 acre-feet, respectively, based on their senior rights. In the most extreme drought conditions, California and Nevada would have priority for Colorado River water over Southwest Arizona. In this scenario, Southwest Arizona, and the whole state, could be in a state of disaster, with massive impact on population, ultimately resulting in mass population migration out of state. Additionally, if there is insufficient water in the reservoirs, hydro power is affected, impacting millions of users.

The strength of California and its possible impact on Southwest Arizona water rights causes a great deal of concern. California's rhetoric seems to be asking for a "browning" of Arizona agricultural land, and the cross-hairs of California policy seem to be pointing at Arizona's water rights. Nevertheless, Yuma farming practices are the global role model for water efficiency, producing more yields with less land and water than similar farming communities in California. Unlike Arizona, California has failed to maximize the use of its water.

Ultimately, the Colorado River is owned and controlled by the federal government, and the Bureau of Reclamation and the Department of the Interior oversee the signing of agreements with states and communities for the allocation of water from the Colorado River. If the federal government declares a drought emergency, everyone may suffer. Yuma County water districts enjoy most of the highest priorities for Colorado River water in our state, however, in severe drought conditions, the federal government may proceed as it sees fit to allocate shortages despite past agreements.

The second line of authority is the Arizona State Government. Southwest Arizona will not have security until all of Arizona is healthy. Therefore, it is important that Yuma County continue to promote adequate water supply for **all** of Arizona. But ultimately the primary issue is that, in times of severe drought, the federal government is going to be the final say on how the water is utilized. When it comes to alternative actions, it is imperative that Yuma County is represented in the discussions both at the state and federal level. Holding to the integrity of the covenant, standing up to the word of those who entered into a contract should be a priority—

landowners in Arizona should hold their ground and seek enforcement of the law of the river as it currently exists.

Should Lake Mead elevations get to a point where the federal government becomes involved, politics could greatly affect the distribution priorities along the river. The Secretary of the Interior is a political appointee and will likely respond to political pressure. When a state as large as California begins fining people for water use, politics become a driving force in water allocations. But it is unlikely the federal government will stop water flowing to municipalities—which could leave agriculture to suffer. Unfortunately, politics often lead to legal processes for solutions, but litigation takes time and does not solve emergencies or crises. Extended drought would allow the US Secretary of Interior to become the water master and reallocate water based on his/her thoughts on what is most important. The law is currently on our side, but this could be circumvented or diluted if it becomes a political issue or eventually goes to the Supreme Court for a new ruling on the existing water rights.

A reduction of established water entitlements for Yuma County is a possible consequence should the federal government get involved or the state of Arizona focus on its large municipalities over its agricultural communities. Southwest Arizona is concerned that other users of the river may try to discredit the agricultural industries and related industries in order to gain support for the redistribution of entitlements. Pulling water from Yuma would decimate the community, even if less than half of the water is reallocated. It does not work economically, as agriculture is the key economic driver for the region. Eliminating or seriously damaging this industry would have drastic consequences, not unlike the consequences playing out in some areas in California. Southwest Arizona, and the State as a whole, should not follow in California's footsteps.

It is difficult to watch California's past bad decisions being paid with Arizona's water. Now, California is beginning to wise up. Yet Phoenix news stations show the California water crisis but Phoenix and Tucson metro users do not seem to be aware that it could be the same in Arizona if the water supply is further reduced. It is hard to get municipalities to understand the implications of a water shortage while the water is still flowing; they do not appear to want an education. But if action is delayed until a true emergency, then the action is too late. Fortunately, there are indications that individuals understand the water concern—70% of Maricopa residents responding to a recent poll indicated that they were willing to pay a tax for a new dam and water storage. Other alternative actions include the State and local jurisdictions passing ordinances that require low flow toilets, requirements or voluntary reductions in lawns and increased use of desert landscaping, and/or numerous conservation remedies to reduce consumption for their municipal areas. However, some of these practices bring other consequences, such as sewer problems arising from the use of low-flow toilets.

The Potential Effects of a Reduction in Yuma County's Water Entitlements

A reduced water entitlement would impact all three of Yuma's main economic drivers: agriculture, military, and tourism. The overall impact to the economy would be devastating. Once the produce distribution and processing infrastructure is gone, it will likely never come back. Young people will no longer consider agriculture career opportunities and will be forced to seek other employment/careers outside Yuma County. This would have a domino effect: if farming ceases to be the primary business in Yuma County, all of the ancillary businesses decline as well. This leads to a loss of jobs, tax income, school funding, property value, and an overall decline in the quality of life. Yuma would become an undesirable place to live, affecting the military base, tourism, and all of the current residents who call Yuma County home.

This is not mere speculation. When you start downsizing the industries upon which rural cities depend, they are negatively impacted—the Imperial Valley and the city of Blythe in California, are prime examples. The overall economic impact can be devastating. Here, water is the life blood of this area and without it, we cease to exist as a viable community. Further, a reduction in Yuma's Colorado River water usage may also displace people, which is a tremendous human capital problem. Short term actions could have long term issues for human capital and quality of life that affect the state on a much larger scale. This is a regional economic impact issue, not just a local issue.

Global economies are affected as well. What we produce in the area is shipped all across the United States and exported overseas and is often exchanged for a product that is imported back to the USA. It would also negatively impact surrounding areas on both sides of the border. Higher charges for water and production will also result in higher prices in the market for all consumers across the US.

Another reality is that if Yuma does not produce the food, it comes from a foreign country. The single greatest issue for growers today is food safety and the perception of a threat. Without domestically grown produce, we cannot ensure the safety of our food supply.

Southwest Arizona's Water Conservation Efforts and Pursuit of Alternative Water Sources to Serve Demand

Southwest Arizona has taken actions to ensure that Yuma County's future water needs are met. Contracts with the Bureau of Land Reclamation and the various irrigation districts around the state have been made to establish Yuma's water rights and protect them in the future. Intrastate, laws and rules for the provisioning of water require certain processes to be followed to protect rural areas against the transfer of their water rights without due process. Nevertheless, there are additional measures that can be taken to preserve the current water supply, through both protecting the current allotment and developing new water sources.

Educating the state populous regarding the food and agricultural industry has been, and should continue to be, a priority in order to protect the current allotment. The region should establish local coalitions that are familiar with the issues surrounding water use in our area. Such

coalitions can be used in community outreach to educate and in the review of water usage, efficiency, and benefits. This includes educating urban legislators who may not be familiar with water use in our area and, by doing so, establishing relationships with leadership at both the state and federal level on the importance of water use in Yuma and the need to protect those water rights. A grassroots approach, through the education of citizens through small things such as garden projects in every school, also increases public awareness of agriculture and water use.

Above all, the Yuma community needs to stay vigilant and actively involved with situation. It is easy to lose a fundamental right if the community does not appreciate the issue. Obviously, farmers stay involved by necessity, but it needs to remain topical for the community outside of the farming advocates. Farm community outreach into schools to assist in debunking myths is one additional intersect between agriculture and the community that must continue. Better information creates knowledge and more informed decisions. There is an apparent lack of public awareness in Arizona's urban centers and a resultant divide between agriculture interests and municipal interests, but as a State we are all in this situation together, with economic impacts in the Southwest affecting the larger municipalities. We need to get the conservation message out through media to the consumers, telling the Yuma County story and our message regarding water in a big, impactful way. Large urban areas look to reduce Yuma's resources, but fail or refuse to consider any limitation on population growth in their areas, even though they are without adequate water supplies.

When it comes to conservation to protect our water, Arizona farmers are doing it right. Farmers grow crops efficiently, which is a front-line conservation effort. Farming is successful at conservation of water not because it is required, but because the industry demands growing in the most efficient and profitable manner. The use of best practice irrigation methods results in conservation of water. Precision agricultural practices are widely utilized, i.e. laser leveling, concrete-lined ditches, greenhouse germination, and sprinkler systems. Large increases in agriculture efficiencies have seen increased production with decreased water consumption.

Yuma County agriculture has been extremely proactive in conservation measures and is a model for other areas of the country. Much of the low hanging fruit in agricultural water conservation has already been harvested; however, we should continue to pursue a leading role in further advances, such as plant breeding technologies, which brings plants tolerant of low water and salt, shorter growing seasons, and other efficient outcomes. The agricultural community is technologically savvy and always looking for new innovations for success.

Agriculture conservation is industry driven. Other industries need to be knowledgeable of their water use and follow suit with their own conservation methodologies. Agriculture often is an easy target for its water consumption, but other users need to step up and join the effort to conserve as well. Commercial businesses must also be involved in conservation efforts.

In residential conservation, per capita residential usage has dropped quite a bit, from an average of 14,000 gallons a person per month to 12,000 gallons. This is attributable to more efficient usage of appliances and low flow devices. Conversely, the downside is the need to raise rates to keep up with the fixed cost to operate municipal water systems. Requiring developers of agricultural land for residential purpose to transfer all water rights associated with the development to municipal use has also been helpful. Xeriscape landscaping, promotion of low- or no-water plants, and rewards for synthetic grass also have helped to cut residential water usage. Las Vegas has provided a good model for residential water conservation through the use of low-flow and lower usage plumbing.

Even more conservation opportunities seem to exist in urban areas. Municipalities could tighten building codes, requiring low use fixtures, desert or low-water landscaping, and utilizing more reclaimed water. The Arizona state government could explore legislation that incentivizes more conservation. Locally, Yuma could emulate communities such as Lake Havasu and Tucson that seem to do a better job of low water use landscapes. There needs to be a public outreach encouraging water conservation methods in residential developments, and potentially sanctioning overuse.

Few alternative sources of water to supplement Colorado River entitlements have been identified. Much of the groundwater in Yuma County is in fact Colorado River water entitlement. The aquifers we do have are often of poor quality, such as those in San Luis, or are 500-600 feet deep, like those in Wellton. Though often advanced as an alternative, the desalination of ground water that has not yet been tapped has yet to be effectuated, as it is presently not economically viable. The cost of desalination and the disposal of brine are biggest obstacles to overcome.

Yuma already discharges 10,000 acre-feet of reclaimed water into the Colorado River, and, in some cases, to recharge the ground water, at a rate of about 1.5 million gallons a day. Other cities discharge into the drainage canal which flows into Mexico. Increasing storage to capture reclaimed water is an option for the future. While this would require resources not readily available, groups like the Central Arizona Project may be interested in something like this that may add additional water to the system. Further, supporting the use of alternative programs in other areas would also contribute to the system locally—such as cloud seeding in Utah, which contributes to our downstream flows.

Under current conditions, there really is minimal incentive for Yuma County to develop alternative Colorado River sources because the water that is not used ultimately gets used by someone else, like the Central Arizona Project. We should look at ways to increase our Colorado River storage capacity in Senators Wash by rebuilding the dam. We should also look at adding new Colorado River water storage in the Wellton area to supplement existing storage. However, the cost of building a new storage capacity in Wellton is estimated to be around \$10 million.

Southwest Arizona strongly believes that solutions for agriculture water use for the Yuma area need to originate from Yuma in consultation with statewide stakeholders. Solutions that are

political in nature, or used in other regions, may not work here due to the unique needs of this agricultural community.

The Contributions and Benefits from Yuma County's Water Uses

Yuma is a leader in providing high quality, safe food for the world. We produce food including produce, dates, seeds, wheat, grains, and others. Apart from produce, we grow wheat that is shipped all over the world for its high protein content—many Italian pastas shipped to this country are made from Yuma-grown wheat. As another example, the medjool date industry is a finite, niche market, which requires more education to the public because it is a growing industry. The technology that has developed as a result of the agriculture industry extends well beyond the county borders to have a national and international effect, both in growing and food safety. Regionally, the contributions lead to jobs, economic growth, and viability. Nationally and globally, the local industry remains on the cusp of new technology and is looked to for leadership by all levels of the industry and government. A highly respected economist has opined that Yuma is to U.S. agriculture what Silicon Valley is to U.S. computer and electronic production.

The food safety industry has been the leader in developing standards, with procedures that have become a model for the nation. Many food safety regulations were developed in Southern California and Arizona, and Yuma County has pioneered many of these efforts. The Yuma County food processing industry has an outstanding food safety record and reputation. Local growers maintain tight watch on produce growing to keep food safe. Every single employee is aware of the standards, which are state of art. Yuma Agriculture leads innovation with water use and is now taking the lead in food safety. Produce buyers, including organic buyers and conventional buyers, purchase Yuma grown produce because it is known to adhere to the highest safety standards.

Yuma is a leading developer in technological practices—water usages, plant production, seed development, and others. We no longer have enough cropland to feed ourselves because we have urbanized so much of it. Yet through advances, we have become increasingly efficient, teasing larger yields from smaller areas. In the last two years alone, Yuma County has led others in the nation with drone testing. A drone can tell where the soil is rich or where it is bad, giving a birds' eye view to identify issues that can prevent big problems with a crop. Advances in arid desert agriculture and irrigation are being studied and modeled all over the world, as are seed genetics and growth models. Our practices provide a template for efficient farming globally.

Food security will always be a problem and concern, but there is great support by our local farmers who are donating to local organizations and taking part in changes and developments through their own businesses. The excellent University of Arizona extension program is nationally recognized. Our industry not only feeds people across the country, but also countries around the globe. If we lose water and can no longer produce food, our nation will lose food security. Like manufacturing, once we lose our ability to grow our own food, we may never get it back. Yuma is part of a western region circle that keeps the country supplied with fresh vegetables all year round. Yuma ground is active twelve months out of the year, which is very unique in farming. This locally produced food capability helps prevent food insecurity in our nation.

Yuma County agriculture is a \$2.5 billion per year industry. The agriculture economy is less subject to national recessions and tends to stabilize the local and state economy. Yuma water provides a significant tax base and advances the state economy, both through the agricultural industry and the ancillary business and activities. Global visitors come to Yuma to examine how the Yuma region has implemented new techniques and to enjoy the available recreational opportunities. Food products are exported to tremendous financial advantage to this country. Also, it should not be overlooked that the water and the industry it supports allows the region to feed itself.

Addressing the Rapidly Growing Urban Areas Who May Look to Yuma County's Water Allotment for Other Uses

While Yuma County is not in crisis today, we have neighbors who are or will be, and this is a political reality that must be faced. Yuma often feels like it's trapped in a David and Goliath situation, facing municipalities with far larger resources, loud political clout, and overwhelming votes. We need to understand their positions, but also educate them regarding the benefits and viability of the uses of water in the Yuma County area that apply not only to us but to those areas of crisis as well. One such example would be food safety, as the risk associated with importing food to supplement what would otherwise grow here needs to be explained and understood by those who believe simply importing the food supply from another source is the answer.

We need to promote ourselves more effectively. How we tell our story may vary depending on the audience, but it is vital to continue to tell it in order to reach the maximum amount of people. Through media and social outlets, we must show how we, as a region, are part of the national conversation. Be intentional and frame the focus as a marketing campaign to raise awareness of what will be lost. We would benefit from more media attention to Yuma's value for the good of the global economy, and it can start with simple steps, like labeling packaged salad with Yuma, AZ as its point of origin. A conversation has begun but how or what the negotiation would be is still not defined. We seem to have the majority of the state on our side, if we can just get our story told effectively.

Yuma should hire professional marketers, pull the whole of Yuma County together, and tell a unified compelling story. We need some sort of an equitable method, like a Yuma Agricultural Alliance, to share the cost of this effort across all parts of the economy. The Agricultural Legislative Tour is a great example of the kinds of efforts of which we need more. Other efforts, such as grassroots education like Arizona Common Sense, get all relevant parties involved while defending our rights and issues. Other programs of focus include the Yuma Area Agricultural Council, Yuma Visitors Bureau's agri-tourism programs, and the Western Growers' school garden programs in the elementary schools.

Further, we are in a great position to capitalize on the trend towards healthy, fresh, U.S. grown vegetables. Some retailers are starting to require producers to answer questions about "sustainability standards", like amount/type of fertilizer, water sources, etc. By understanding the standards and leading efforts to set these local, state and national standards, we can preserve and promote the "brand" of Yuma agriculture.

Similarly, we should proactively share our conservation success stories in agriculture and build partnerships with others across the state where we share similar interests. We produce 20% more crops with 20% less water as compared to 1980. Partnerships with groups such as forest wildfire management should be considered, as, in this instance, the issues not only affect the burned areas, but the watershed and all downstream users.

Currently, people with little or no understanding as to where food comes from or the importance of agriculture are telling us what we need to do. There are a lot of dynamics in these programs that are being suggested by those outside of Yuma, most of them driven by money. While the other basin states are a concern, Maricopa County is our largest threat right now—they have the money, the votes, the need. This issue is an ongoing battle that has been going on for a long time and there is no end in sight. It is imperative that Yuma stay politically engaged on these issues. Again, if the State is healthy, the pressure is off Yuma. Representatives from other areas sometimes fail to consider third party consequences of their plans to take Yuma's water—employment, tourism, education, quality of life, etc.

As the state grows its residential and commercial development, developers should be required to account for how much and from where the needed water will come, without impeding on existing users, prior to approval of the development. There should not be approval for the growth without an increase in conservation efforts. Unbridled urban area growth is an immediate short-term threat to Yuma water. Urban areas should not grow larger than their water availability.

But the greater threat in the next 15 years may be the environmental issues at the federal level. The federal goal is periodic flood flows. We will also be forced to address NGO agendas in the near future. Developing partnerships with others who are recipients of the benefits of water use in Yuma County needs to be continued and expanded upon. This includes developing greater relationships with leaders at the state and federal level for purposes of education and obtaining support. Ultimately, Yuma needs to be proactive as a voting base, and elect representatives who understand the issue. Metropolitan lawmakers may not even realize the scope of the issue or how it would affect others, so Yuma should have representatives and a constituency that understands the issue. Protecting water rights requires vigilance.

As it stands, there is no legal way to take away water rights. Water would need to be purchased by a willing buyer from a willing seller. Currently, laws make water purchase and transfer difficult. Political changes could allow willing sellers to sell to willing buyers. This comes down to property rights and whether citizens want water to attach to property.

The Owner of Water Rights and the Economic Impacts of Fallowing

Generally, Colorado River water rights are held by the water districts, but the City of Yuma and the County of Yuma have water rights, too. The “owner” depends on the water district. For example, in the Wellton Mohawk Irrigation and Drainage District the district owns the rights, and in the Yuma County Water Users District, it is the landowner who holds the rights. The district's board of directors decides whether or not to sell or lease the water rights. This makes the composition of the water district boards very important.

What is also true is that the Colorado River is unquestionably federally owned. Though rights are proprietary, there are significant regulations. For example, rights can be sold to a willing buyer; however, the process to sell rights is very complex and needs to be approved by the Secretary of the Interior. It is the water right owner's prerogative to sell its rights, but there are third party consequences that are not always considered. The seller of rights is still obligated to maintain a water delivery system. It is debatable who owns the groundwater under your own land. There are different views on where the bright line is that separates river water from ground water. This confusion creates an issue when it comes to maintaining the system and who is responsible for the maintenance.

Clearly, the question of who is the "owner" is a very difficult one, and the answer lies within the governing structure of the different organizations. Water politics is a contact sport, and there may be water wars in the future. Yuma continues to have a target on its back. Our water is the golden water, as we have the best priorities (contracts) for water in the State.

One proposed "solution" is to fallow ground in Yuma County, but every acre of ground fallowed is a reduction in economic activity in the Yuma area. The economic impacts go back to the benefits associated with farming. If you are fallowing, you are not farming. It would be important to put limits on how much production may be taken out by fallowing and everyone needs to be in agreement, including other irrigation districts so to satisfy the provisions in the various contracts between the Bureau and the district.

Agriculture is an economic engine that supports the majority of industries in Yuma County, which are secondary support services. Fallowing land to move water into other areas provides almost no benefit to the local community. Further, less industry jeopardizes military operations and tourism. In order to maintain viable military bases such as MCAS and YPG, there must be a community to support them. Damaging agriculture could seriously alter the face of the community, which could result in collateral damage to the military presence as well.

Fallowing also causes soil chemistry problems causing an influx of salts in the soil. The result is a less productive field when it is returned to production. Yuma farmers are better off doing crop rotation than fallowing. Those recommending fallowing are posing it as having no down side and offering money, but neglecting the third party impacts. Fallowing moves economic growth to urban areas from Yuma County, and should this recommendation be implemented, Yuma may become an economically depressed area in a few years.

It is also important as to who receives the funds for the fallowed land. In the past, in some districts, it was the district that was paid, which benefited a few persons and hurt the community generally. In other districts, the farmers received direct payment, which stayed in the community.

Lessons to be Learned From Other Parts of the Country and World

California has faced many challenges in its water crisis. In Imperial County, they have suffered significantly in their economy due to removal of farm production for fallowing. Efforts to build a desalination plant on the coastline has proved difficult due to regulations established by the state. California is pumping millions of gallons of reclaimed water back into the ocean

because they have deemed it unsafe. They are overly focused on environmental issues. We can learn a lot from California about what not to do. We can learn, and leverage public opinion from the results of the Owen's Valley case.

Other countries with far more drastic water situations have been more likely to explore technologies currently too costly for the United States. Saudi Arabia, Israel and other Middle Eastern countries are ahead of the pack globally with regard to desalination. But their proximity to the sea and ability to dispose of the salt probably makes it more viable there than in Yuma. For us, the main hurdle seems to be cost and energy. However, the cost of desalination of ground water or ocean water is different, as ground water desalination is considerably less expensive due to the lower saline content. Ocean water has a much higher saline content and its removal requires a lot more expense in terms of energy and even water itself. The funding of desalination investments must be addressed, to some extent, through agreements with municipalities or whoever would directly benefit from the process. Governmental subsidies may be appropriate. Water has not, as yet, become a national security issue to the US, but it should be.

Locally, finding a way to begin use through retrofitting of the existing desalination plant to treat brackish water may prove beneficial in assisting other areas in near crisis or crisis as well. A high percentage of Arizona voters are in favor of building reservoirs for water conservation and fishing; we could use more reservoirs. Wastewater treatment has also proven successful in Texas. Other out of the box efforts might include water brokering, such as used in Australia, exploring agreements with Western Canada to utilize their water, or assisting California with building a coastal desalination plant.

A Plan of Action for Yuma County

The essential elements of an action plan for Yuma to protect our most precious resource and ensure adequate water for the future are *education* and *vigilance*.

Education is key, from young students to adult citizens. An educated population is an essential element, as they understand that Yuma is not at fault for using the water that the federal government did not adequately allocate. Every farming organization and related businesses need to have a website and/or any other means to educate the public on what agriculture and water use means to the Yuma County and how it impacts not only the local community but the surrounding communities, states and nation as well. Educating our young people on the grade school through college level is also critical. There are existing outreach programs that can be expanded to fit this need, such as through the Farm Bureau. Industries directly impacted, local governments and community chambers need to contribute to this education. We should identify sources for funding needed for education such as: 1) grants and other available resources, such as foundations and major corporations, to provide funding as needed; 2) the industry itself; 3) government; and 4) collaboration by others industries that benefit. Also, by tapping into retirees and other people who can write and help develop marketing strategies, we can best get the message across and create better outreach at lower cost.

Conservation should be part of the school curriculum. It should also be promoted through other programs, like community forums, ads in newspapers, seminars at libraries. Too many people and overly rapid growth has attributed to potential water shortages that can be, in part, assuaged through conservation. Also, we must stop converting prime farm land to residential and commercial use.

Southwest Arizona must directly address negative ads and comments regarding the agriculture industry with positive facts regarding efficient food production and the importance of food safety. Campaigns statewide to Legislators and other elected officials, are needed to educate these state leaders of the same is crucial. In short, we need greater awareness. Facilitating local multi-day tours of the industry is one example of what is needed. We must identify those who will serve to monitor the issues and advocate for the rights associated with water use, either through water districts or other ag related groups. Ideally, identifying a way to bring leaders of all stakeholder groups to a single table to draw a consensus on issues and the strategies to address the same can lead to a cohesive and comprehensive strategic plan. We must look for natural partners who share the same interest that we do with regards to water, water use and the water rights and add them to the discussion. Western Growers, Arizona Farm Bureau, Leafy Greens, the Fresh Vegetable Association, the Yuma Water Coalition group, Arizona Common Sense, the Cattlemen's Beef Association, and others all have direct contact with the legislature and vested interests in protecting water rights.

Locally, we must have a group of people from Yuma who are constantly politically engaged at the table whenever water is being discussed. We need to regularly monitor what water bills are being considered and what is going on in the Legislature. On the federal level as well as the other lower basin states we also need to monitor legislation, to stay informed with what they are doing or trying to do. Yuma should always be involved whenever the word "water" is spoken. Historically, Yuma has been very proactive in this and we must continue. The top three things we need to effectuate this plan are: 1) money—to pay professionals to stay on top of this and fight the fight on behalf of Yuma; 2) vigilance and awareness of the issues; and 3) active public relations. Even though some organizations will not take a stand on the water issues, we can still build relationships with them so that they will notify Yuma representatives when water issues are the topic of discussion. The irrigation districts are extremely supportive and contribute to the groups fighting for our water.

Further, water augmentation research needs to continue. There is not any new water source at this time, except the ocean and desalination. Augmentation, therefore, seems to take on a new meaning -- to take from other users in the state. Here, dam building could assist, but most natural streams and rivers have existing dams and there is plenty of storage up river. What Yuma needs is local storage to capture excesses and rainfalls.

Lastly, Arizona should also complete its statewide allocation. In order to further secure Yuma's water, the State needs to finish the allocation process to identify shortfalls. Yuma spends efforts identifying future threats, but some of the other rural farming communities in Arizona that are part of active management programs have some serious immediate problems which must be addressed promptly. Water is a critical input for Yuma area production systems, and area growers have been quick to adopt new production and irrigation technologies that have

dramatically improved crop yields while at the same time reducing overall water use. The productivity and efficiency of the Yuma County agricultural industry has improved dramatically over the past 40 years, and today, the region serves as one of the world's premier crop production regions. Arizona needs to know that Yuma is a national center of agricultural production in the United States and Yuma county ranks at the very top of U.S. counties in several measures of agricultural sales, acreage and production.