

White Paper: Water, Habitat, Economy – A Shared Vision of the Future for the Guadalupe River System and San Antonio Bay

This white paper describes the shared vision of the Guadalupe-Blanco River Authority (GBRA) and The Aransas Project (TAP) regarding the future for the Guadalupe River system and San Antonio Bay. The Guadalupe River system includes all surface tributaries of the Guadalupe River including the San Antonio River, and it also includes the hydrologically-connected Edwards Aquifer.

Our vision has two equally important and interrelated prongs: first, there must be timely development of sufficient additional water supplies needed to meet all current and future water needs of the rapidly increasing human population within the watershed of the Guadalupe River system; and second, there must be effective and comprehensive stewardship (including, if and where determined to be necessary, restoration) of the lands and waters within the watershed and San Antonio Bay. The intent of this document is that both prongs will be pursued simultaneously.

With respect to the first prong, for decades now GBRA and other water suppliers have struggled to timely develop sufficient supplies to keep up with the water demands of the rapidly increasing human population within the watershed of the Guadalupe River system. There are significant unmet demands for commitments of firm water today and both short term and longer term needs for additional supplies. For the most part, these water needs have been adequately investigated in the existing and ongoing work of Region L, which will be one cornerstone of the work set out in this document. As a general proposition, this prong of our vision is well studied yet nonetheless a key to the long-term plan for the watershed.

With respect to the second prong, GBRA and TAP both are committed to protecting the overall health of the Guadalupe River system and San Antonio Bay. TAP and GBRA have fought over this issue for almost ten years and disagree on many issues but in signing this document, they both agree to work together to attempt to find creative ways to address the long term health of San Antonio Bay. For decades now concerns have been raised about the possible impacts on the Guadalupe River system and San Antonio Bay resulting from steadily-increasing water use - of both surface waters and groundwater pumped from the hydrologically-connected Edwards Aquifer. Concerns have also been raised about changing land use patterns throughout the entire watershed of the Guadalupe River system and the adjoining coastal watersheds that drain to coastal waters; in particular, those changes in land use include rapidly-increasing urbanization and change and decline in farming and ranching. And concerns have been raised about the need to protect the habitat of all endangered species; and, for one of them - the whooping crane - the need to also expand its habitat.

GBRA and TAP believe it is in the best interests of the region and state for the two parties to now work together - both to pursue matters they agree on, and also to try to resolve by agreement important issues on which they remain in disagreement. We have found much that we agree on.

In this white paper, GBRA and TAP outline their jointly-developed concept and vision for exploring and finding a practical, long-term solution that timely meets all water supply and other needs of the increasing human population within the Guadalupe River system watershed while at the same time protects natural systems and allows them to continue to flourish.

The Concept

We believe that smart decisions regarding the choice, financing, and timing of development of future water supplies for the region, combined with private sector and market-based tools and state and federal initiatives, can secure the future of the Guadalupe River system and San Antonio Bay. There are several key and interrelated aspects that should be explored and combined into a workable long-term strategy for protecting both human and natural resources.

A central element of our plan is undertaking research activity to develop concrete proposals to solve particular, identifiable problems. A key to undertaking that research is the availability of federal, state and private funding which will be needed to fund the study areas identified below. And to help accomplish these goals, we propose to bring together a broad, community-based stakeholders' committee to provide continuity for what promises to be a very long-term, ongoing effort.

Our Shared Vision

The most important element of our shared vision is that we both believe that there are creative and innovative approaches, not yet discovered or fully appreciated, that can bring parties as disparate as GBRA and TAP together to work for the common good of the region. After years of disagreement on many key issues, it is sometimes difficult to find common ground, yet we are committed to finding and building upon that common ground. That is the vision and the intent of this document.

To this end, we have identified numerous areas for study that collectively, and even perhaps individually, may lead to the identification of this high ground where GBRA and TAP both find that their long-term goals are met. A key element of this shared vision is the belief that market mechanisms and private sector actions may be very important in creating a different approach in the future. And while governmental action remains a central aspect of any long-term water program in Texas, the market system may offer significant benefits that have not been fully realized at this point in time. Additionally, we are committed to the involvement of stakeholders within the region that wish to be involved in this effort.

Specific Focal Points

(1) Water Re-Allocation and Management - It is agreed that current water use and allocation in the entire watershed of the Guadalupe River system (which includes both the Guadalupe and San Antonio River watersheds) should be fully evaluated and are open for discussion. GBRA is willing to consider any reasonable option regarding the potential re-allocation of water for an environmental use, if it is determined that the re-allocation would result in a meaningful environmental improvement and that same improvement could not be achieved with

less water, and if timely replacement and supplementation is assured so that inventory is maintained for human needs and the additional supplies needed to meet future demands are timely developed in a relatively cost-neutral manner. To this end, several specific water re-allocation and management strategies should be evaluated, and all holders of permits for both surface water and hydrologically-connected groundwater will be invited to participate in these discussions.

If, for example, it is determined that an existing supply of stored water needed to satisfy current or projected demands should instead be sold and used for releases to the bay, that supply would obviously no longer be available for supply for human use and, therefore, a substitute supply must be provided for human use in order to free up the stored water for the bay. Likewise, if it is determined that a portion of a particular existing run-of-river water right needed to satisfy current or projected demands should be acquired and set aside for the environment, those actions would result in less water being available for human use and, again, a substitute supply would need to be provided for human use. These substitute supplies are typically not considered to be needed new supplies of water, but the cost will be new water cost, and the price or charge for a re-allocation generally should be based on that cost. So, if the substitute supplies are ultimately to come from desalination of water from the Gulf of Mexico, the desalination plant and related facilities (intake facilities, return facilities, storage facilities, including Aquifer Storage and Recovery (ASR) well fields, conveyance facilities, etc.) must be sized and designed to take into account those amounts of water in addition to needed new supplies.

A necessary first step is to identify the full gamut of amounts of existing supplies of stored water that may now or eventually be available for sale or lease for the environment, or existing surface water rights or Edwards Aquifer rights that may now or eventually be available for sale or lease for the environment, or surface water rights that may now or eventually be available for agreement for imposition of minimum streamflow conditions for the environment. Next, for each amount of stored water or water right identified, there should be an evaluation of the quantifiable benefits that would result from the purchase or lease or streamflow condition imposition, and whether the purchase or lease or agreement for streamflow condition imposition could occur immediately and, if not, when or under what conditions it could occur. Finally, all forms of financing for the purchase or lease or agreement for streamflow condition imposition should be identified.

A significant concern is the growing focus on both “indirect” and “direct” reuse of treated sewage effluent as a water supply strategy, with so-called “indirect” reuse proposals for discharged effluent. While reuse of wastewater can provide localized benefits, it can have significant associated impacts on existing water rights and water management as well as instream flows and freshwater inflows to the Guadalupe Estuary. One result of the research considered here would be the development of a comprehensive understanding of this issue and its impact on river flows, including the development of a water re-use legal analyses and policy recommendations for the watershed of the Guadalupe River system.

(2) The True Value of Water - Another important task is to determine the extent to which pricing mechanisms could be developed to identify the “full cost” of surface water and to explore the usage of pricing mechanisms to begin to create a fair market for existing and alternative water sources. While surface water is a valuable commodity, suppliers generally sell it with no

specific charge for the commodity (charges for surface water supplied generally have been based on costs associated with permitting and annual South Texas Watermaster fees, debt service and O&M). Similarly, suppliers generally sell Edwards water with no specific charge for the commodity (charges for Edwards water supplied generally have been based on costs associated with the operations of the Edwards Aquifer Authority (EAA) and the EAA Habitat Conservation Plan, debt service and O&M).

It seems appropriate for suppliers to consider charging a commodity charge for both surface water and water pumped from the Edwards based upon impacts that are determined to occur either within the river itself or in San Antonio Bay under various flow conditions. Artificially low water prices do nothing to encourage conservation or assist development of new sources of water. A commodity charge could be used to fund a replacement water supply or mitigation activities if and to the extent environmental harm is demonstrated to be caused by pumping.

For example, while there has been general agreement that decrease in productivity of certain species in the marine ecosystem can result from significant periods of time of low river flows, drought conditions along the coast with little or no rainfall on or surface runoff to coastal waters, and concomitant salinity rises in adjacent marshes and the bay and estuary, there has never been a generally-accepted showing of lost coastal productivity or quantification of a dollar cost for lost coastal productivity due solely to removal of water from the river system. Research should be undertaken to determine whether lost productivity due solely to removal of water from the river system can be demonstrated and quantified and, if so, to then determine the associated cost and explore mechanisms to adjust the price paid for water to take into consideration the “full cost.” Particular attention should be paid to equity issues of water availability and fiscal implications on water providers. Similarly, research should be undertaken on other important considerations in costing water.

(3) Market Based Mechanisms to Provide Additional Base Flow Generated through Watershed Improvements - A third concept related to water that we intend to explore is related to market-based mechanisms to make changes to the watershed in general. For example, when native prairie grasslands are restored, the potential exists that springs and seeps will be enhanced and base flows increased during times of otherwise low flows, creating a commodity for which landowners can be paid, and potentially increasing water supplies during dry conditions. By restoration activities, base flow improvements could be accomplished for the Guadalupe River and its tributaries, and freshwater inflow benefits to reduce salinities may also be realized for high coastal marshes and other waters along the coastline that are not directly affected by river flows. Moreover, a market may also be emerging for farmers and ranchers choosing to restore native prairie grasslands for carbon sequestration. Carbon markets now exist around the world and some expect that demand for terrestrial sequestration of carbon will rise, creating an additional potential market for farmers and ranchers through restoration of native prairies.

The basic concept here is that traditional market mechanisms such as commodity contracts could be used to create cash flow for landowners restoring native prairie ecosystems. This willing buyer and willing seller format is being developed by the Severe Storm Prediction, Education and Evacuation from Disaster (SSPEED) Center at Rice University through a project called the Texas Coastal Exchange and has been well received. Additional research needs to be undertaken to determine the extent to which the implementation of an ecosystem services transaction system

within the Guadalupe River system watershed would make more water available during dry conditions than is otherwise available.

As such, this ecosystem service market, when fully developed, would be a complement to the purchased and donated conservation easements that are already being used within the Guadalupe River system to address the protection of biodiversity, water quantity and quality. This research could lead to a prototype adaptable throughout the State for watershed restoration and increased cash flow to ranchers and farmers.

(4) Climate Change - The Potential for Droughts More Severe and Prolonged Than the Drought of Record - The potential exists that climate change will alter the flows in rivers and streams such as the Guadalupe River system, as well as rainfall that occurs along the coast - rainfall on or surface runoff to coastal waters, including high coastal marshes and adjacent coastal waters. Research conducted to date indicates that one aspect of climate change is to increase the frequency, duration and/or intensity of relatively rare events. This is true for both severe droughts and severe rainfall events. In other words, our droughts may become worse over time and so might our floods. And while this may mean that there is less base flow in the Guadalupe River system and less rainfall on or surface runoff to coastal waters at certain times, there might be more excess flows at other times.

The point is that aspects of climate that have been assumed in the past need to be reconsidered. This issue needs to be studied to determine the extent to which long-term water availability projections currently utilized by TCEQ and firm yield analyses conducted by GBRA and other water providers, as well as projected impacts on the bays and estuaries, may need to be reconsidered looking into the future. And consideration needs to be given as to whether or not there are water and land management strategies that fit with projected possible changes in climate.

(5) Sea Level Rise - The sea level of the Gulf Coast has been rising. If that continues, existing salt marshes will become submerged, existing freshwater habitats along the coast will become more vulnerable to spreading salt water, and storm surges will increase due to a higher base elevation of sea level, threatening inland communities that were once considered safe. The impact of potential sea level rise needs to be considered comprehensively within the San Antonio Bay complex. As part of this effort, the long-term potential for species habitat protection and the mitigation of storm surges will be considered.

(6) Guadalupe River Delta Preservation and Restoration - The movement of water within the Guadalupe River delta is complex and restoration of portions of the Delta could possibly have a positive impact on the environment. A thorough analysis of possible changes and impacts needs to be undertaken, including full evaluation of the existing salt water barrier and other man-made structures, various outlet channels and bayous, and sedimentation pattern within the delta. Measures should be considered for implementation to improve the monitoring of water flows into San Antonio Bay and the deposition of sediment within the delta. As part of this effort, the long-term potential for species habitat improvement should be considered. Due to the complexity of the delta, a high resolution 3-D model or its equivalent may be required to complete this analysis. Additionally, the potential for log jams and flooding associated with the delta will be analyzed and an integrated plan for management of the delta and its adjacent flood plain will be pursued.

(7) Whooping Crane Habitat - The U.S. Fish and Wildlife is looking for about 125,000 acres of habitat for whooping cranes and to date about 25,000 acres have been conserved. There are two questions here - where are we in danger of losing habitat to sea level rise and where are additional lands that could be acquired or managed to allow the expansion of whooping cranes into new habitat areas? As part of this effort, lands within the Guadalupe, Lavaca, and Colorado River watersheds as well as the Colorado-Lavaca, Lavaca-Guadalupe, and San Antonio-Nueces Coastal Basins (including Copano Bay) will be evaluated for their suitability for habitat for whooping cranes. Further, mechanisms will be identified for willing buyer and willing seller transactions as well as ecosystem service transactions to try to bring this habitat into management for whooping cranes.

(8) Sea Turtle Habitat - The extent and usage of the Guadalupe Estuary and associated bays by the endangered Kemp's Ridley sea turtle as well as other species of sea turtles is poorly understood and should be researched further to determine the extent of the presence and the potential for undertaking management activities in support of such species.

(9) Freshwater Mussels - Freshwater mussels are being considered for listing under the Endangered Species Act in almost every river basin within the state of Texas, including the Guadalupe River system. The extent of the presence freshwater mussels within the Guadalupe River is still poorly understood and should be researched further to determine the extent of the presence and the potential for undertaking management activities in support of such species.

(10) Marine Seawater and Brackish Groundwater Desalination - The Gulf of Mexico should be prioritized as the primary source of future additional and substitute municipal and industrial water supplies. Expedited permitting, financing and development of desalination and related facilities for this practically unlimited, drought-proof water resource will go a long way towards limiting pressures on existing water supplies that threaten both economic growth and effective ecosystem protection and restoration. Brackish portions of aquifers should also continue to be explored as potential sources of future additional and substitute municipal and industrial water supplies. GBRA and TAP will work to ensure that sources of desalinated water are integrated into regional sources of water supply as rapidly as possible in a cost competitive manner while minimizing energy demands associated with salt removal.

Potential Sources of Funding

There are a number of sources of potential funds to implement the program described above. It is the intent of GBRA and TAP to pursue multiple potential sources of federal, state and private funding.

Statement of Commitment by the Parties; Legal Effect of White Paper; Future Changes

GBRA and TAP are committed to working together to try to achieve our shared vision as outlined in this white paper. However, nothing in the paper legally binds either party. No statement herein shall be consider an admission by GBRA or TAP. Should we decide to seek joint funding for research, we will consider a more structured arrangement with respect to the funds. GBRA and TAP each may withdraw from the relationship outlined in this white paper at

any time. We encourage suggested revisions to the paper at any time in order to accurately reflect our views at that time and the then-current facts and circumstances.

Signed:



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Date: 2/22/16



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