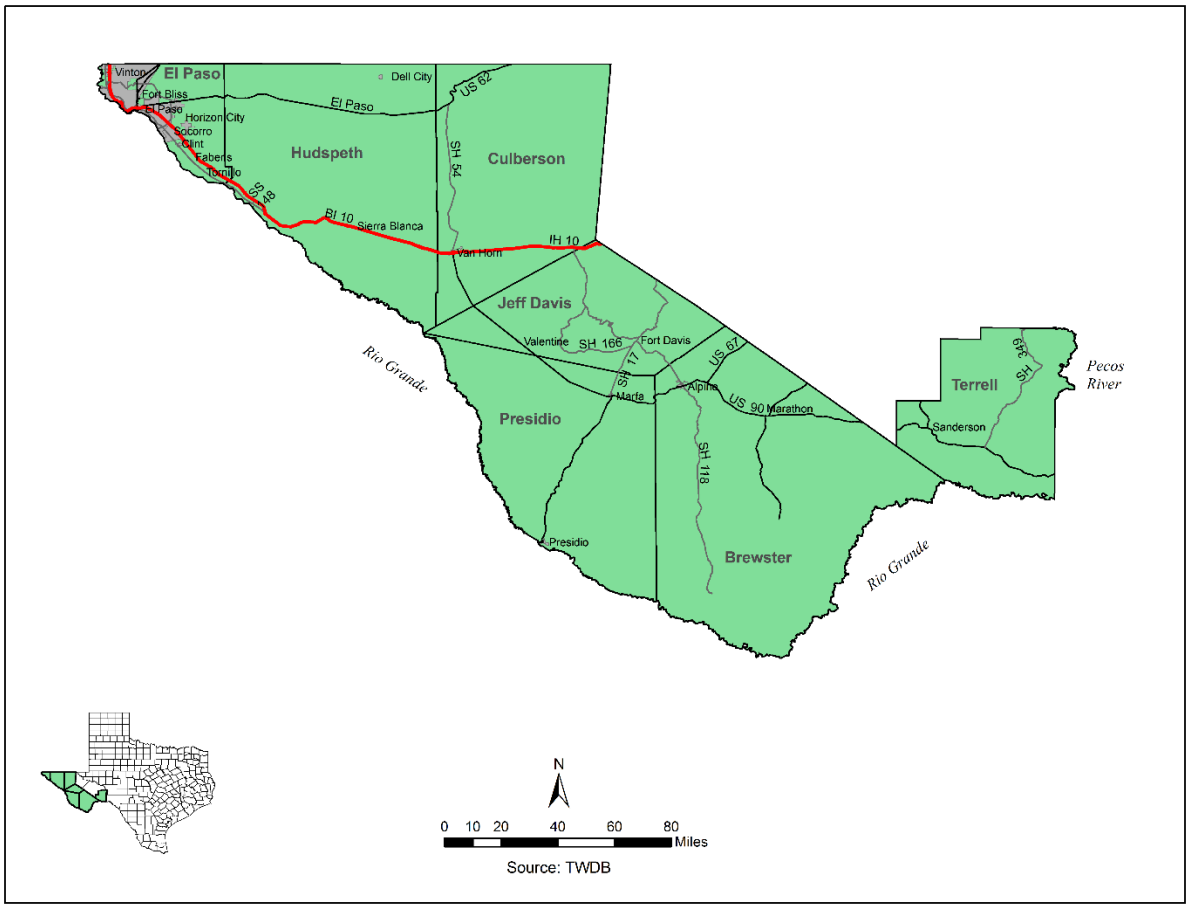
EXECUTIVE SUMMARY

Far West Texas encompasses the most arid region of the State of Texas. Residents of this expansive desert environment recognize that water is a scarce and valuable resource that must be developed and managed with great care to ensure the area's long-term viability. The Region's economic health and quality of life are dependent on a sustainable water supply that is equitably managed.

Far West Texas is bounded on the north by New Mexico, on the south and west by the Rio Grande and the United Mexican States, and on the east by the Pecos River and incorporates the counties of Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, Presidio and Terrell, all which lie solely within the Rio Grande River Basin. These counties claim some of the most impressive topography and scenic beauty in Texas. The Region is home to the Guadalupe Mountains National Park, Big Bend National Park, and the contiguous Big Bend Ranch State Park. El Paso, the largest city in the Region, is also the nation's largest city on the U.S.-Mexico border. Ciudad Juarez, with an estimated population of over 1.5 million, is located across the Rio Grande from El Paso, and shares the same water sources with El Paso.

Figure ES-1. Far West Texas Region Water Planning Area Map



In January of 2016, the fourth round of regional water planning was concluded with the adoption of the *2016 Far West Texas Water Plan*. It is understood that this *Plan* is not a static plan but rather is intended to be revised as conditions change. For this reason, the current *2021 Far West Texas Water Plan* put forth

in this document is not a new plan, but rather an evolutionary modification of the predecessor *Plan*. Only those parts of the original *Plan* that require updating, and there are many, have been revised.

The purpose of the *2021 Far West Texas Water Plan* is to provide a document that water planners and users can reference for long- and short-term water management recommendations. Equally important, this *Plan* serves as an educational tool to inform all citizens of the importance of properly managing and conserving the delicate water resources of this desert community.

The *2021 Far West Texas Water Plan* follows an identical format as the plans prepared by the other 15 water planning regions in the State as mandated by the Texas Legislature and overseen by the Texas Water Development Board. The *Plan* provides an evaluation of current and future water demands for all water-use categories, and water supplies available during drought-of-record conditions to meet those demands. Where future water demands exceed an entity's ability to supply that need, water management strategies are considered to meet the potential water shortages. Water management strategies are also presented that reflects an entity's desire to upgrade their water supply system. In all cases, conservation practices are first considered in managing water supplies.

Because our understanding of current and future water demand and supply sources is constantly changing, it is intended for this *Plan* to be revised every five years or sooner if deemed necessary. This *Plan* fully recognizes and protects existing water rights, water contracts, and option agreements, and there are no known conflicts between this *Plan* and plans prepared for other regions.

POPULATION AND WATER DEMAND

Except for El Paso County, the counties of Far West Texas are among the least populated in the State. In the year 2020, approximately 97 percent (925,565) of the Region's 954,035 residents are projected to reside in El Paso County, where the population density is 914 persons per square mile. The population density of the six rural counties is 1.2 persons per square mile. Approximately 75 percent of the residents in the Region are Hispanic or Latinos.

El Paso, one of the fastest growing cities in Texas, is the largest city in the Region, with a year-2020 projected population of 734,031. This is 79 percent of the total population of El Paso County and 77 percent of the Region's total population.

The year-2020 projected county populations served by water-supply utilities (mostly representing cities) and representing county other (rural domestic) in the six rural counties are as follows: Brewster County (9,727); Culberson County (2,695); Hudspeth County (3,913); Jeff Davis County (2,398); Presidio County (8,692); and Terrell County (1,045). Population of smaller communities such as Fort Hancock, Dell City, and Valentine are included in the "County Other" (rural) population of each county.

The regional population is projected to increase to 1,551,438 by the year 2070, which is an increase of 597,403 citizens. Most of this increase (563,305) is projected to occur in El Paso County.

Total projected year-2020 water consumptive use in Far West Texas is 480,424 acre-feet. The largest category of use is irrigation (310,403 acre-feet), followed by municipalities and county-other (142,507 acre-feet), steam-electric cooling (10,545 acre-feet), mining (7,835 acre-feet), manufacturing (7,033 acre-feet), and livestock (2,101 acre-feet). Sixty-five percent of water use in the Region is by the agricultural sector in support of irrigation. Thirty percent is used by municipalities and the remaining 5 percent supports manufacturing, steam-electric generation, livestock and mining.

The potential role of conservation is an important factor in projecting future water supply requirements. In this *2021 Plan*, conservation is only included in the municipal projections as a measure of expected savings based on requirements of the State plumbing code. All other conservation practices are discussed in terms of water supply strategies and as a component of drought management plans.

Environmental and recreational water use in Far West Texas is recognized as being an important consideration as it relates to the natural community in which the residents of this Region share and appreciate. In addition, for rural counties, tourism activities based on natural resources offer perhaps the best hope for modest economic growth to areas that have seen a long decline in traditional economic activities such as agriculture and mining.

Rural communities (outside of El Paso County) are relatively small and are generally reliant on self-provided water supplies. Water demand within these communities is related directly to their population trends and is thus relatively stable or moderately increasing over the next 50 years. Projected water-demand growth for the numerous communities within El Paso County is significantly greater and thus will require a level of coordinated intercommunity planning.

Water used for agricultural irrigation in Far West Texas is significantly greater (65 percent of total) than all other water-use categories. On a regional basis, water used for the irrigation of crops is projected to

remain constant over the 50-year planning horizon. However, as any irrigator can attest, climate, water availability, and the market play key roles in how much water is actually applied on a year-by-year basis.

Ciudad Juarez is located across the Rio Grande from El Paso, and currently is 100 percent dependent on the Hueco Bolson and Conejos Medanos Aquifers to satisfy all its municipal and industrial demands. With a growing population that is currently estimated to be over 1.5 million, Ciudad Juarez recognizes the limitations of the Hueco Bolson to supply future demands. In addition, plans are being developed to convert 38,000 acre-feet/year of surface water from the Rio Grande (Rio Bravo) for municipal supply use. Currently, Mexico's allocation from the Rio Grande Project of 60,000 acre-feet/year is used for irrigated agriculture. The conversion would involve supplying wastewater effluent to farmers in exchange for surface water.

WATER SUPPLY RESOURCES

Whether it flows in rivers and streams or percolates through underground rock formations, water sustains life and thus is our most important natural resource. In the Chihuahuan Desert environment of Far West Texas, water supply availability takes on a more significant meaning than elsewhere in the State. With evaporation far exceeding rainfall, planning for the most efficient management of limited water supplies is essential.

Water supply availability from each recognized source is estimated during drought-of record conditions. This allows each entity and water-use category to observe conditions when their supply source is at its most critical availability level. Specific assumptions used in estimating supply availability are listed below:

- Except for controlled flows in the Rio Grande, very little surface water can be considered as a reliable source of supply in Far West Texas, especially in drought-of-record conditions. In this chapter, two primary surface water sources are considered, the Rio Grande and the Pecos River. Other ephemeral creeks and springs (cienegas) are recognized as important livestock supply, wildlife habitat, and recreational resources. The availability of water in the Rio Grande and Pecos River (Run-of-River) to meet existing water rights, including municipal water rights, is determined by the TCEQ Rio Grande Water Availability Model (WAM)–Run 3, except for supplies from the Rio Grande Project. All surface water rights are listed in Appendix 3A.
- The availability of groundwater is based on TWDB provided Modeled Available Groundwater (MAG) as developed through the Groundwater Management Area process. For aquifers that MAG volumes have not been assigned, groundwater availability is calculated separately.
- Direct reuse refers to wastewater that is reused without first being discharged into a stream or other watercourse. Direct reuse of water is calculated for El Paso Water based on anticipated build-out of their “purple pipe” project and advanced purified water treatment projects. Indirect reuse refers to wastewater that is first discharged to a stream or watercourse before being diverted for use. The indirect reuse supply is used during the irrigation season.
- No groundwater availability requirements or limitations as might have been promulgated by the El Paso County Commissioner’s Court are associated with the El Paso County Priority Groundwater Management Area. El Paso Water continues to assume the role as the designated “Regional Water Supply Planner”.
- Water supplies based upon contracts are assumed to be renewed if they expire during the planning horizon.

The Rio Grande originates in southwestern Colorado and northern New Mexico, where it derives its headwaters from snowmelt in the Rocky Mountains. The Elephant Butte Dam and Reservoir in New Mexico is approximately 125 miles north of El Paso and can store over two million acre-feet of water. Water in the reservoir is stored to meet irrigation demands in the Rincon, Mesilla, El Paso, and Juarez Valleys and is released in a pattern for power generation. Above El Paso, flow in the River is largely controlled by releases from Caballo Reservoir located below Elephant Butte; while downstream from El Paso to Fort Quitman, flow consists of treated municipal wastewater from El Paso, untreated municipal wastewater from Juarez, and irrigation return flow. Below the El Paso-Hudspeth County line, flow

consists mostly of return flow and occasional floodwater and runoff from adjacent areas. Channel losses are significant enough that the Rio Grande is often dry from below Fort Quitman to the confluence with the Mexican river, the Rio Conchos, upstream of Presidio. There are no significant perennial tributaries, other than the Rio Conchos, in the 350 miles between Elephant Butte Reservoir and Presidio.

The Rio Grande is unique in its complexity of distribution management. Because the waters of the River must be shared between three U.S. states and Mexico, a system of federal, state and local programs has been developed to oversee the equitable distribution of water. Compacts, treaties and projects currently provide the River's management framework.

The Pecos River is the largest Texas river basin that flows into the Rio Grande. Originating in New Mexico, the Pecos flows southerly into Texas, and discharges into the channel of the Rio Grande near Langtry in Val Verde County. The River forms the easternmost border of Far West Texas along the northeast corner of Terrell County. Flows of the Pecos River are controlled by releases from the Red Bluff Reservoir near the Texas - New Mexico state line. Storage in the reservoir is affected by the delivery of water from New Mexico. According to data of the IBWC, the Pecos River contributes an average of 11 percent of the annual streamflow into the Rio Grande near Amistad Reservoir. The Pecos also contributes more than 29 percent of the annual salt loading into the reservoir.

Other than irrigation use and a portion of City of El Paso municipal use from the Rio Grande, almost all other water use in Far West Texas is supplied from groundwater sources. Although not as large in areal extent as some aquifers in the State, individual aquifers in Far West Texas are more numerous (10 TWDB designated and 3 Planning Group designated) than in any of the other planning regions.

El Paso has nearly 50 miles of reclaimed water lines (purple pipeline) in place in all areas of the City. Reclaimed water serves the landscape irrigation demand of golf courses, parks, schools, and cemeteries, and provides water supplies for steam electric plants and industries within the City. Currently EPW is operating three reuse projects that provide 6,000 acre-feet per year. This *Plan* explores the potential of a significant increase in reuse of existing supplies by evaluating strategies of advanced treatment to produce purified water that meets state drinking water standards.

Springs and seeps are found in all seven of the Far West Texas counties and have played an important role in the development of the Region. Springs were important sources of water for Native Americans, as indicated by the artifacts and petroglyphs found near many of the springs. In the 18th and 19th centuries, locations of transportation routes including supply and stagecoach lines, military outposts, railroads, and early settlements and ranches were largely determined by the occurrence of springs that issued from locations in the mountains and along mountain fronts.

Springs contribute to the aesthetic and recreational value of private land and parkland in Far West Texas - especially in the Big Bend area, where many thermal springs discharge along the banks of the Rio Grande. Springs are significant sources of water for both aquatic and terrestrial wildlife as they form small wetlands that attract migratory birds and other fowl that inhabit the Region throughout the year. The FWTWPG recognizes the importance of all springs in this desert community for their contribution as a water supply source and as a natural habitat. However, the FWTWPG chooses to respect the privacy of private lands and therefore specifically identifies "Major Springs" occurring only on state, federal, or privately owned conservation managed lands.

WATER MANAGEMENT STRATEGIES

Projected water supply deficits in Far West Texas during the next 50 years are identified where anticipated water demands exceed available supplies. Available supplies represent the largest amount of water that can be diverted or pumped from a given source without violating the most restrictive physical, regulatory, or policy condition limiting use, under drought-of-record conditions. Water supply deficits are identified for specified municipal utilities, irrigation use, mining use, and steam power electric generation in El Paso County; and in the Rural counties, for irrigation use in Culberson County, and for mining use in Hudspeth and Terrell Counties.

Water supply strategy recommendations intended to meet the deficits are made for those water use groups that have projected water supply shortages. In addition, strategies have been developed for entities that have expressed a desire for planned projects for which funding applications have been or will be made in the future to be included in the *Plan*. In the development of water management strategies, existing water rights, water contracts, and option agreements are recognized and fully protected.

A strategy evaluation procedure was designed to provide a side-by-side comparison such that all the strategies could be assessed based on the same factors. Specific factors considered were:

- Quantity of water supply generated
- Water quality considerations
- Reliability
- Cost (total capital cost, annual cost, and cost per acre-foot)
- Environmental impacts
- Impacts to agricultural and natural resources

To adequately consider the unique challenges faced by municipal and industrial water users in El Paso County, a conjunctive approach was used to establish feasible strategies capable of identifying sufficient future supplies to meet the water needs of El Paso Water, the largest wholesale water provider in the county. The following recommended projects are to be managed conjunctively to produce a mixed total distributed supply:

- Municipal conservation programs
- Advanced water purification at the Bustamante WWTP
- Expansion of current Hueco Bolson Aquifer ASR
- Groundwater development in the Dell City area (Phase I and II)
- Additional alternate projects including advanced water purification, expansion of existing groundwater use, treatment and reuse of other local supplies, and expansion of existing desalination facilities

Recommended strategies for other entities in El Paso County include purchasing needed supplies from El Paso Water or developing needed self-supplied groundwater by drilling additional wells and expanding desalination facilities.

Irrigation shortages in El Paso County is the direct result of insufficient water in the Rio Grande during drought-of-record periods to meet anticipated needs. The quantity of water needed to meet the full demands cannot be realistically achieved and farmers in these areas have generally approached this situation by reducing irrigated acreage, changing types of crops planted, or possibly not planting crops until water becomes available during the following season.

In some cases, farmers may benefit from Best Management Practices (BMPs) for agricultural water users, which are a mixture of site-specific management, educational, and physical procedures that have proven to be effective and are cost-effective for conserving water. However, a local study of these practices found that very limited opportunities exist for significant additional water conservation in Far West Texas irrigated agriculture. Those practices that suggest economic efficient additional water conservation included lining or pipelining district canals and the very small potential for additional irrigation scheduling and tail water recovery systems. In nearly all cases, these practices have been adapted if applicable, further emphasizing the very limited opportunities for additional conservation. If these strategies were implemented, the water conserved would satisfy less than the projected unmet agricultural water demand in 2070 during drought-of-record conditions. Based on this evaluation, the FWTWPG recommends tail-water reuse, improvements to water district delivery systems, construction of a regulating reservoir, and the development of a new diversion point at the La Union canal to attempt to meet the estimated irrigation needs in El Paso County.

Although most of the communities in the rural counties do not project shortages, it is apparent that many the communities have water issues that are appropriate for listing in this *Regional Plan*. Therefore, strategies have been evaluated and presented that will hopefully provide incentive for the future development of water resources to address these issues. The *2021 Far West Texas Water Plan* contains a total of 48 recommended water management strategies and 10 alternative strategy with a total estimated capital cost for develop of $2,110,409,105.

WATER QUALITY

Water quality plays an important role in determining the availability of water supplies to meet current and future water needs in the Region. The quality of groundwater and surface water is evaluated to help determine the suitability of each source for use and the potential impacts on these sources that might result from the implementation of recommended water management strategies.

Groundwater quality issues in the Region are generally related to naturally high concentrations of total dissolved solids (TDS) or to the occurrence of elevated concentrations of individual dissolved constituents. High concentrations of TDS are primarily the result of the lack of sufficient recharge and restricted circulation. Together, these retard the flushing action of fresh water moving through the aquifers. Some aquifers, however, have a low TDS but may contain individual constituent levels that exceed safe drinking-water standards. For example, some wells in the Igneous Aquifer have exceptionally low TDS but contain unsatisfactory levels of fluoride.

Groundwater quality changes are often the result of man's activities. In agricultural areas, aquifers such as the Bone Spring-Victorio Peak have increased in TDS. Irrigation water applied on the fields percolates back to the aquifer carrying salts leached from the soil. Beneath El Paso and Ciudad Juarez, the average concentration of dissolved solids in the Hueco Bolson Aquifer has increased as the fresher water in the aquifer is being consumed. Although local instances of groundwater quality degradation have occurred in the Region, there are no major trends that suggest a widespread water-quality problem due to the downward percolation of surface contaminants.

The Rio Grande and the Pecos River are the principal surface water sources in Far West Texas. Unlike groundwater, surface water quality can vary significantly depending on the amount of flow in the streambed and the rate and source of runoff from adjacent lands. Salinity is an issue associated with the Rio Grande, especially during drought conditions. River flows arriving at El Paso contain a substantial salinity contribution from irrigation return flow and municipal wastewater return in New Mexico. Under current conditions, approximately 25 percent of the applied irrigation water is needed to move through the project in El Paso County to keep the salt loading at reasonable and manageable levels given average surface flow rates. Studies have shown that salinities in the Rio Grande can increase to over 1,000 mg/l during May and September, depending on actual irrigation demands and releases from reservoirs.

Downstream from El Paso, most of the flow consists of irrigation return flow, and small amounts of treated and untreated municipal wastewater. Heavy metals and pesticides have been identified along this segment of the Rio Grande. Flow is intermittent downstream to Presidio, where the Rio Conchos augments flow. Fresh water springs contribute to the Rio Grande flow in the Big Bend and enhance the overall quality of the River through this reach.

The Pecos River is not a source of drinking water for communities in Far West Texas; however, it is the most prominent tributary to the Rio Grande on the Texas side of the River above Amistad Reservoir. According to IBWC data, the Pecos River contributes an average of 11 percent of the annual stream flow in the Rio Grande above the Reservoir and 29 percent of the annual salt load. Independence Creek's contribution in Terrell County increases the Pecos River water volume by 42 percent at the confluence and significantly reduces the total suspended solids, thus improving both water quantity and quality.

WATER CONSERVATION AND DROUGHT CONTINGENCY

Water conservation are those practices, techniques, programs, and technologies that will protect water resources, reduce the consumption of water, reduce the loss or waste of water, or improve the efficiency in the use of water. Recycling or reuse of water is also a creative method of managing water so that it can be used more than once or for alternative uses. Water conservation and drought contingency planning implemented by municipalities, water providers, and other water users supersede recommendations in this *Plan* and are considered consistent with this *Plan*. Texas Water Code §11.1271 requires water conservation plans for all municipal and industrial water users with surface water rights of 1,000 acre-feet per year or more and irrigation water users with surface water rights of 10,000 acre-feet per year or more.

El Paso Water is the largest supplier of municipal water in Far West Texas and has been implementing an aggressive water conservation program, which has reduced the per capita demand from about 225 gpcd in the late 1970s to a current level of 128 gpcd. The continuation of the conservation effort is a key component of the El Paso Water Integrated Water Management Strategy.

Drought is a frequent and inevitable factor in the climate of Texas. Therefore, it is vital to plan for the effect that droughts will have on the use, allocation and conservation of water in the State. Far West Texas is perennially under drought or near-drought conditions compared with more humid areas of the State. Although residents of the Region are generally accustomed to these conditions, the low rainfall and the accompanying high levels of evaporation underscore the necessity of developing plans that respond to potential disruptions in the supply of groundwater and surface water caused by drought conditions. In the consideration of regional conservation and drought management issues, the FWTWPG reviewed active water conservation and drought management plans provided to the planning group by public water suppliers and irrigation districts.

The Texas Legislature has established a process for local management of groundwater resources through groundwater conservation districts. The districts are charged with managing groundwater by providing for the conservation, preservation, protection, recharging and prevention of waste of groundwater within their jurisdictions. Six districts are currently in operation within Far West Texas.

- Brewster County Groundwater Conservation District
- Culberson County Groundwater Conservation District
- Hudspeth County Underground Water Conservation District No.1
- Jeff Davis County Underground Water Conservation District
- Presidio County Underground Water Conservation District
- Terrell County Groundwater Conservation District

PROTECTION OF WATER, AGRICULTURAL, AND NATURAL RESOURCES

The long-term protection of the Region's water, agricultural, and natural resources, and the environment is an important component of this *2021 Far West Texas Water Plan*. The first step in achieving long-term water resources protection was in the process of estimating each source's availability. Surface water estimates were developed through a water availability model process (WAM) and are based on the quantity of surface water available to meet existing water rights during a drought-of-record. The availability of groundwater is based on TWDB provided Modeled Available Groundwater (MAG) as developed through the Groundwater Management Area process. For aquifers that MAG volumes have not been assigned, groundwater availability is based on previous geohydrologic studies, groundwater data including historical use contained in state and federal databases and groundwater availability models (GAMs). Also included are groundwater supplies that are made available by the desalination of brackish groundwater sources. Establishing conservative levels of water source availability thus results in less potential of overexploiting the supply.

The next step in establishing the long-term protection of water resources occurs in the water management strategies to meet potential water supply shortages. Each strategy was evaluated for potential threats to water resources in terms of source depletion (reliability), quality degradation, and impact to environmental habitat. Water conservation strategies are also recommended for each entity with a supply deficit. When enacted, the conservation practices will diminish water demand and thus extend supplies over the stress period.

Agriculture includes the raising of crops and livestock, as well as a multitude of businesses that support this industry. Water is an absolute necessity to maintaining this industry and its use represents over three-fourths of all the water used in the Region. It is thus important to the economic health and way of life in the Region to protect water resources that have historically been used in the support of agricultural activities. The *2021 Far West Texas Water Plan* provides irrigation strategy recommendations that address water conservation management practices. If implemented, these practices will result in reduced water application per acre irrigated and diminished water losses due to canal leakage. All non-agricultural recommended water management strategies include an analysis of potential impact to agricultural interests. Any strategy that necessitates the conversion of water use from agricultural practices is voluntary at the current water right and landowner's discretion.

The FWTWPG has adopted a stance toward the protection of natural resources. The protection is closely linked with the protection of water resources as discussed above. Where possible, the methodology used to assess groundwater source availability is based on not significantly lowering water levels to a point where spring flows might be impacted. Thus, the intention to protect surface flows is directly related to those natural resources that are dependent on surface water sources or spring flows for their existence.

Environmental impacts were evaluated in the consideration of strategies to meet water-supply deficits. Of prime consideration was whether a strategy potentially could diminish the quantity of water currently existing in the natural environment and if a strategy could impact water quality to a level that would be detrimental to animals and plants that naturally inhabit the area under consideration. The FWTWPG has also recommended several "Ecologically Unique River and Stream Segments".

RECOMMENDATIONS

An important aspect of the regional water planning process is the opportunity to provide recommendations for the improvement of future water management planning in Texas. The recommendations are designed to present new and/or modified approaches to key technical, administrative, institutional, and policy matters that will help to streamline the planning process, and to offer guidance to future planners regarding specific issues of concern within the Region. The FWTWPG approves of the legislative intent of the regional water planning process and supports the continuance of water planning at the regional level. In further support of the planning process, the FWTWPG suggests that the Legislature and TWDB consider the following issues pertaining to water management policy, regional water planning process, and water research needs.

- Stormwater / flood planning that encourages retaining stormwater as a water supply source
- Support of funding for Colonias projects
- Encouragement of State legal rectification to protect Rio Grande Compact
- Re-emphasis of the planning function of the regional water planning group and need for more local planning initiatives
- Allowance of modification of demand numbers
- Dissatisfaction with inter-period modification of contractual planning guidelines
- Dissatisfaction with unfunded Task 5A planning requirement
- Suggestion of several specified water research and data needs that would support the local planning process

As a part of the planning process, each regional planning group may include recommendations for the designation of ecologically unique river and stream segments in their adopted regional water plan. The Texas Legislature may designate a river or stream segment of unique ecological value following the recommendations of a regional water planning group. As per §16.051(f) of the Texas Water Code, this designation solely means that a state agency or political subdivision of the State may not finance the actual construction of a reservoir in a specific river or stream segment designated by the legislature under this subsection. The Far West Texas Water Planning Group intends that no negative impact is to occur to upstream landowners as a result of these designations.

The FWTWPG chooses to respect the privacy of private lands and therefore recommends as "Ecologically Unique River and Stream Segments" the following three streams that lie within the boundaries of state-managed properties, four within National Park boundaries, and specified streams managed by the Texas Nature Conservancy and the Trans Pecos Water Trust. ~~New to this *2016 Plan* is the recommendation of a segment of Terlingua Creek in Brewster County that is within the boundaries of the Big Bend National Park.~~

- Rio Grande Wild and Scenic River (Big Bend National Park)
- McKittrick Canyon and Choza Creek (Guadalupe Mountains National Park)
- Cienega Creek (Chinati Mountains State Natural Area)

- Alamito and Cienega Creeks (Big Bend Ranch State Park)
- Alamito Creek (Trans Pecos Water Trust)
- Independence Creek (Texas Nature Conservancy - Independence Creek Preserve)
- Madera Creek, Canyon Headwaters of Limpia Creek, Little Aguja Creek, and Upper Cherry Creek (Texas Nature Conservancy - Davis Mountains Preserve)
- Terlingua Creek (Big Bend National Park)

The firm yield for any reservoirs constructed on even the most reliable Far West Texas watercourses is not likely to exceed 2,000 acre-feet per year. For this reason, the *2021 Far West Texas Water Plan* does not recommend any watercourse for designation as "Unique Sites for Reservoir Construction."

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ES – APPENDIX

TWDB WATER PLANNING DATA REPORTS

- **Water User Group (WUG) Population**
- **WUG Demand**
- **WUG Category Summary**
- **Source Availability**
- **WUG Existing Water Supply**
- **WUG Needs / Surplus**
- **WUG Second-Tier Identified Water Needs**
- **WUG Second-Tier Water Needs Summary**
- **Source Water Balance (Availability – WUG Supply)**
- **WUG Data Comparison to 2016 Regional Water Plan**
- **Source Data Comparison to 2016 Regional Water Plan**
- **WUG Unmet Needs**
- **WUG Unmet Needs Summary**
- **Recommended WUG Water Management Strategies**
- **Recommended Projects Associated with Water Management Strategies**
- **Alternate WUG Water Management Strategies**
- **Alternate Projects Associated with Water Management Strategies**
- **WUG Management Supply Factor**
- **Recommended Water Management Strategy Supply Associated with a New or Amended Inter-Basin Transfer Permit *(No relevant data for the FWT Region)***
- **WUG Recommended WUG Supply Associated with a New or Amended Inter-Basin Transfer Permit and Total Recommended Conservation Water Management Supply *(No relevant data for the FWT Region)***
- **Recommended Water Management Strategy Supplies Unallocated to WUG *(No relevant data for the FWT Region)***
- **WUG Strategy Supplies by Water Management Strategy Type**
- **WUG Recommended Water Management Strategy Supplies by Source Type**
- **Major Water Provider Existing Sales and Transfers**
- **Major Water Provider Water Management Strategy Summary**

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