

**TO:** Plateau Region Water Planning Group  
**FROM:** WSP USA - Planning Group Consultant  
**SUBJECT:** Request to Obtain a Notice-to-Proceed on Task 5A  
**DATE:** January 30, 2019  
**PROJECT:** Scope of Work and Budget Allocation for Task 5A Water Management Strategy Analysis

TWDB Task 5A includes the development and evaluation of water management strategies and completion of Chapter 5 of the 2021 Plateau Region Water Plan. This task considers all statutory requirements and TWDB guidance. The scope items that are necessary for statutory compliance are outlined in the executed contracts; however, specific scopes of work for the evaluations of potentially feasible water management strategies are to be developed by the regions. All funds for this task are contingent upon written notice-to-proceed. The total budget in the executed contract for the Task 5A effort is \$76,608.

The Plateau Region Water Planning Group presented to the public for comment its overall methodology for identifying potentially feasible water management strategies (Attachment 3) on February 15, 2018 and gave final approval to the process and its inclusion in the Technical Memorandum on October 24, 2018.

The Plateau Region Water Planning Group, following an opportunity for public input, approved this Task 5A Scope and Budget for submittal to the TWDB at a public planning group meeting in Leakey, Texas on January 30, 2019.

This document contains the following Attachments:

Attachment 1 – TWDB Exhibit C Guidelines – 5.2 Water Management Strategy Evaluations

Attachment 2 – Plateau Region Potentially Feasible Water Management Strategies

Attachment 3 - Methodology for Identifying and Selecting Potentially Feasible Water Management Strategies

Attachment 4 – Plateau Region Potential Strategy Scope of Work and Budget (TWDB-Formatted Spreadsheet)

## **SCOPE OF WORK FOR WATER MANAGEMENT STRATEGIES (TASK 5A) FUNDS**

Strategies to be included in the 2021 Plateau Region Water Plan were discussed at Planning Group open meetings where the Planning Group chose to include the current list of potentially feasible strategies that fulfilled the following conditions:

- (1) Strategies that help to relieve a water supply needs condition;
- (2) Strategies from the 2016 Plan that are still considered viable;
- (3) Strategies from WUGs that currently have water supply projects requested for funding before the TWDB;
- (4) Strategies from WUGs that have specifically asked to be included in the 2021 Plan;
- (5) Strategies to meet conditions expressed in a public survey performed earlier this planning period;
- (6) Strategies that address TWDB water loss audit issues; and
- (7) Strategies that consider the most recent Water Supply Management, Water Conservation, and/or Drought Contingency Plans where available.

To facilitate the development of the scope of work for water management strategies, a preliminary needs assessment has been conducted to better identify entities that will require additional water. Based on this assessment, new and existing strategies are developed to meet the projected needs of 18 WUGs that are identified as having supply deficits over the 50-year planning period. Other strategies are developed for entities that have expressed their specific needs for projects to be included in the regional plan, or that demonstrated a significant water main loss. A total of 71 potentially feasible strategies are grouped into nine categories based on their similar origin of source, components of a regional project, or infrastructure need including. In addition, budget expense is reserved for unanticipated additional strategies, database development, and chapter preparation.

- Conservation – Initiatives
- Conservation – Water Loss and Audit and Main Line Repair
- Conservation - Vegetative Management
- Reuse
- Groundwater Development
- Surface Water Development
- ASR
- Infrastructure Development
- Eastern Kerr County Regional Water Supply Project

The evaluation of all strategies will be in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the Region.

## Conservation Initiatives

Public conservation awareness is the first critical component of a municipal water management program as significant water use reduction can be achieved through conservation awareness programs. This strategy grouping identifies WUGs with identified water supply needs that can benefit by actively increasing their public conservation outreach.

Drought management provides a process for actively initiating water-reduction declarations, monitoring, and enforcement. This group of strategies identifies those entities that have enforcement authority and that can have a positive on water-use management during declared drought events.

Rainwater harvesting is one of the new water management practices recognized and supported by the Texas Water Development Board. This practice is highly recommended for regions of the State where existing water supplies are significantly reduced during drought periods, yet where some rainfall still occurs. This practice is particularly appropriate for the Hill Country portion of the Plateau Region. It is recognized that this strategy in itself may not produce sufficient volumes of water to totally replace all of the volume of water that is reduced during drought periods. However, the volumes produced from rainwater harvesting when used to replace existing supplies for specified purposes will result in the extended longevity of preexisting supplies. A case in point is its implementation in the City of Bandera where existing groundwater supplies have been diminishing for several years. A municipal rainwater harvesting program using roofs of municipal buildings as catchment areas will provide a new beneficial water supply for the city. The municipal rainwater harvesting program will also encourage other private home and land owners to consider rainwater harvesting on their own properties, which will likewise reduce pumping impacts on the local Trinity Aquifer.

### Scope of Work

- Identify existing conservation efforts and potential for increased public awareness of benefits of conservation measures through public education.
- Identify entities with drought management authority and evaluate effectiveness of their programs.
- Evaluate specific sites (municipal and public buildings) in the City of Bandera that are appropriate for rainwater catchment and storage equipment. Evaluate water savings in both supplies generated and cost of providing rainwater for public land irrigation or other appropriate uses. This strategy is cosponsored by the Bandera County River Authority and Groundwater District.

### Entities Potentially Receiving Water from Public Conservation Programs WMSs:

2 Municipal and County Other WUGs

### Entities with Drought Management Authority WMSs:

1 Groundwater District WUG

### Entities Potentially Receiving Water from Rainwater Harvesting WMSs:

1 Municipal WUG

TOTAL TASK BUDGET: \$1,532

## **Conservation – Water Loss Audits and Main Line Repair**

Reported municipal use generally includes a variable amount of water that does not reach the intended consumer due to water leaks in the distribution lines, unauthorized consumption, storage tank overflows, and other wasteful factors. For some communities, attending to these issues can be a proactive conservation strategy that may result in significant water savings.

### Scope of Work

- Identify WUGs that reported a water loss of 10 percent or more in a 2015 to 2017 TWDB water-loss assessment survey. Evaluate potential for performing a new water-loss audit and replacing identified water line segments.

### Entities Potentially Receiving Water from Water-Loss Audits and Line Replacement WMSs:

11 Municipal and County Other WUGs

TOTAL TASK BUDGET: \$1,532

## **Conservation – Vegetative Management**

Vegetative Management strategies include two concepts of managing natural environments that positively impact groundwater / surface water interactions, which result in greater base flows to the headwaters of rivers and streams in the Plateau Region. Because the regional water planning process is based on minimal rainfall during a drought of record occurrence, the allowable volume of water generated by this strategy is assumed to be zero. However, during average or better rainfall periods vegetative management is a wise conservation tool. The analysis of Strategy J-12 in the 2016 Plateau Region Water Plan indicates that as much as 10,500 acre-feet per year of additional water in the upper Guadalupe river shed in western Kerr County can be generated by a properly designed brush clearing program. The UGRA has been successfully coordinating with NRCS on such a program for the past several years.

A second aspect of this conservation strategy grouping is the systematic management of invasive phreatophytes such as *Arundo donax* that are significantly damaging natural drainages and reducing existing water availability. In recent years, these plants with high evapotranspiration rates have proliferated in counties that contain the headwaters of several rivers on the Edwards Plateau (including all counties in the Plateau Region). Horticulturalists have estimated that one acre of *A. donax* uses 5.62 acre-feet of water annually, that is about three times as much water as native plants.

Brush Control and Land Stewardship are the 7<sup>th</sup> and 18<sup>th</sup> recommended conservation practice strategies in the TWDB Special Report – Water Conservation Implementation Task Force Report to the 79<sup>th</sup> Legislature (2004).

### Scope of Work

- Identify and evaluate areas where improved brush management programs will positively improve potential for increased groundwater and surface water source supplies. Re-evaluate the volume of water potentially generated by this program during average rainfall periods as estimated in Strategy J-12 of the 2016 Plateau Region Water Plan. Estimate future water volumes potentially available due this program. Develop specific

management principal recommendations that would reduce the potential misuse of the management principals such as total clear cutting of large areas.

- Identify and recognize areas where invasive plant species management has successfully been applied. Recommend additional stretches of streams where similar management practices will likely result in improved hydrologic conditions. Estimate the volume of water that will be generated along each selected stretch of water way.

Entities Potentially Receiving Water from Brush and Invasive Species Management WMSs:

6 County Other WUGs

TOTAL TASK BUDGET: \$1,532

## **Reuse**

Water recycling is reusing treated wastewater for beneficial purposes such as agricultural and landscaping irrigation, industrial processes, or other purposes considered non-potable. This group of strategies identifies municipalities that would benefit from developing a water reuse program or expansion of an existing program.

Scope of Work

- Identify and evaluate municipal water systems that can potentially improve or develop new wastewater reuse applications to assist in meeting future water needs.
- Evaluate the available supplies and appropriate sizing required for identified potential new wastewater collection and treatment facilities.

Entities Potentially Receiving Water from Waste Water Reuse WMSs:

3 Municipal WUGs

TOTAL TASK BUDGET: \$3,830

## **Groundwater Development**

Groundwater development includes the establishment of new water well infrastructure capable of capturing new or additional groundwater source supplies.

Scope of Work

- Identify WUGs that may benefit from projects that develop additional groundwater supplies. Evaluate projects pertaining to the drilling of new water wells.
- Identify WUGs that may benefit from projects that develop additional water supplies by constructing groundwater desalinating facilities. Evaluate potential brackish groundwater supply, water quality issues, and disposal issues.
- Evaluate the potential for developing additional usable water supplies from the Ellenburger Aquifer. Consider the cost of drilling and development of an Ellenburger well in Kerr County. This aquifer has not been previously evaluated in this area.

Entities Potentially Receiving Water from Drilling New Wells or Wellfields WMSs:

19 Municipal, County Other, Irrigation and Mining WUGs

Entities Potentially Receiving Water from Constructing Desalination Facilities WMSs:

1 County Other WUGs

Entities Potentially Receiving Water from Drilling and Development of Ellenburger Aquifer Water-Supply Wells WMSs:

1 County Other WUG

TOTAL TASK BUDGET: \$11,4910

## **Surface Water Development**

Surface water development includes the acquisition of new or additional water rights and the construction of new surface water reservoirs.

Scope of Work

- Evaluate existing water rights, potential for voluntary transfer of rights, and consideration of most beneficial diversion points.
- Evaluate potential for developing an off-channel reservoir in Kerr County.

Entities Potentially Receiving Water from Surface Water WMSs:

2 Municipal and County Other WUGs

TOTAL TASK BUDGET: \$3,830

## **ASR**

Aquifer storage and recovery (ASR) is the process of injecting treated surface water into an underground reservoir (aquifer), storage of that water for a period, and recapturing (pumping) of the stored water for later use. The City of Kerrville is the only municipality in the Region that currently operates an ASR facility. This group of strategies looks at the potential to increase Kerrville's ASR capacity and to consider an ASR option for the proposed Eastern Kerr County Regional Project.

Scope of Work

- Identify WUGs that may benefit from projects that develop additional water supplies by constructing ASR facilities. Evaluate potential sources for ASR injection, water quality issues, geologic capacity to receive, store, and deliver injected supplies.

Entities Potentially Receiving Water from Construction of ASR Facilities WMSs:

2 Municipal and County Other WUGs

TOTAL TASK BUDGET: \$3,064

## **Infrastructure Development**

This group of strategies considers the construction of new or expansion of existing water-supply treatment and storage facilities, and the establishment of emergency interconnections. Infrastructure development strategies must demonstrate an increase in treated water supply volume either as a new supply or through demand reduction.

Scope of Work

- Evaluate the available supplies and appropriate sizing required for the infrastructure improvements to increase supply.

- Evaluate appropriate sizing required for identified new-source water treatment facilities.
- Evaluate expansion of existing treatment facilities.
- Evaluate expansion of existing or construction of new water storage facilities.
- Identify and evaluate potential for emergency interconnects with surrounding communities.

Entities Potentially Receiving Water from Water Treatment WMSs:

1 Municipal and County Other WUGs

Entities Potentially Receiving Water from Water Storage WMSs:

2 Municipal WUGs

Entities Potentially Receiving Water from Water Supply Source Interconnection WMSs:

2 Municipal and County Other WUGs

TOTAL TASK BUDGET: \$7,661

## **Eastern Kerr County Regional Water Supply Project**

The Eastern Kerr County Regional Water Supply Project (EKCRWSP) is a planned regional operation intended to coordinate several water-development projects into a single provider facility that can better serve the water-supply needs of a growing population in eastern Kerr County. Current sponsors of the regional project include the Kerr County Commissioners' Court (KCCC) and the Upper Guadalupe River Authority (UGRA). Individual projects to be developed are listed below, and their scope of work descriptions are provided in the appropriate supply source grouping above.

Supply Source Projects

- UGRA acquisition of surface water rights
- KCCC acquisition of surface water rights
- Construction of an off-channel surface water storage
- Construction of a surface water treatment facility and main distribution lines
- Construction of an ASR facility
- Construction of a wellfield for densely populated rural areas
- Construction of a brackish groundwater desalination facility
- Construction of an Ellenburger Aquifer water supply source

Entities Potentially Receiving Water from the EKCRWSP WMSs:

11 County Other Communities

TOTAL TASK BUDGET: \$15,323

## **Other Projects That May Be Considered:**

There are other projects that are currently being considered by water entities in the Region but we do not have specific information on the projects. These include projects by entities that fall within the “County Other” WUG category that provide water to areas of the Region with concentrated rural population. These projects will be developed and evaluated for the 2021 Plateau Region Water Plan as more information becomes available. Other strategies will be approved by the PRWPG with concurrence of the TWDB prior to evaluation.

TOTAL TASK BUDGET: \$7,661

## **Data Base Entry**

As required by the TWDB rules, all water management strategies that are recommended or adopted as alternate strategies must be entered into the TWDB database for the 2022 State Water Plan. Also, specific reports must be included in the 2021 Plateau Region Water Plan. The effort to enter this data and coordinate with the TWDB has historically taken considerable effort. With the redesign of the database, it may become more efficient but all data will need to be re-entered. Specific tasks associated with the database entry include:

### Scope of Work

- Define each water management strategy (WMS) in accordance with the specific requirements of the database.
- Assign WUGs and WWPs to a specific WMSs. Enter the amount of supply received for each decade. Enter other data required for the WMS source, user and seller, as appropriate.
- Enter capital costs and annual costs for each WUG/WWP as appropriate.
- Coordinate with shared regions as appropriate.
- Perform appropriate QC checks on data entry.
- Coordinate with TWDB database staff.
- Prepare required reports and include in the 2021 Plateau Region Water Plan.

### Entities

All WUGs and WWPs receiving water from a WMS.

TOTAL TASK BUDGET: \$7,661

## **Report Preparation and Coordination**

Chapter 5 of the 2021 Plateau Region Water Plan is one of the most important chapters in the Plan. This chapter is the compilation of the recommended future direction for water supply in the Region. The basics of the strategy development and technical evaluations are included in the scopes of work for the specific strategy types. This task is for the effort to compile all the information developed into Chapter 5 of the 2021 Plateau Region Water Plan. It also includes coordination with the Water Planning Group on the draft chapter and the incorporation of comments for the final chapters in the Initially Prepared Plan and Final Plan.

TOTAL TASK BUDGET: \$11,491

## Fee Summary

<b>TASK NUMBER</b>	<b>TASK DESCRIPTION</b>	<b>BUDGET</b>
1	Conservation - Initiatives	\$1,532
2	Conservation – Water Loss Audit and Repair	\$1,532
3	Conservation – Vegetative Management	\$1,532
4	Conservation – Reuse	\$3,830
5	Groundwater Development	\$11,491
6	Surface Water Development	\$3,830
7	ASR	\$3,064
8	Infrastructure Development	\$7,661
9	Eastern Kerr County Regional Water Supply Project	\$15,323
10	Other Strategies	\$7,661
11	Database Entry	\$7,661
12	Report Preparation	\$11,491
	<b>Total</b>	<b>\$76,608</b>

# ATTACHMENT NO. 1

## TWDB Exhibit C Guidelines

### 5.2 Water Management Strategy Evaluations

All potentially feasible WMSs and WMSPs shall be evaluated in accordance with 31 TAC §357.34. This information shall be included in Chapter 5 of the IPP and final adopted RWP along with additional narrative description and other relevant materials and documentation associated with the RWPG's identification of potentially feasible WMSs considered for the region.

As necessary, RWPGs shall update or redevelop any previous WMS or WMSP evaluations (e.g., developed for other RWPs) to meet current rule and guidance requirements, reflect changed physical or socioeconomic conditions that have since occurred, reflect changes in water project configurations or conditions, consider newly identified WUGs or WWPs, reflect more recent or updated costs, reflect more recent information related to potential impacts to natural or agricultural resources, or, to accommodate changes in identified water needs.

Existing water rights, water contracts, and option agreements shall be protected, although amendments to these may be recommended realizing that consent of owners would be needed for implementation.

WMS and WMSP data presented in the IPP and final adopted RWP shall be structured in a way that is compatible with DB22 as outlined in the TWDB's Contract Exhibit D *Guidelines for Regional Water Planning Data Deliverables*. To facilitate public comprehension of the adopted RWPs and the interactive State Water Plan, the naming conventions for WMSs/WMSPs used in DB22 should also be used in the IPP and final adopted RWP.

All recommended WMSs and WMSPs that are entered into DB22 and prioritized by RWPGs shall be designed to reduce the consumption of water; reduce the loss or waste of water; improve the efficiency in the use of water; or develop, deliver, or treat additional water supply volumes to WUGs or WWPs when implemented in at least one planning decade such that additional water is available during drought of record conditions. Therefore, WMSs that would not produce a measurable yield in at least one planning decade may not be a recommended WMS. Any other RWPG recommendations regarding permit modifications, operational changes, and/or other infrastructure that do not meet these requirements shall be indicated as such and presented separately in the RWP; and shall not be eligible for funding from the State Water Implementation Fund for Texas (SWIFT).

Regional water plans are stand-alone plans and require consideration of all potentially feasible strategies. Any previously recommended strategy that will be recommended in a new RWP must be updated, evaluated, and recommended anew.

RWPGs shall evaluate WMSs and associated WMSPs based on criteria specified in 31 TAC §357.34 and §357.35 including strategy/project water quantities generated, reliability, financial costs, and environmental impacts. For all WMSs and WMSPs previously identified in the 2016 RWPs, RWPGs shall develop and/or update financial costs using the most current version of the WMSP costing tool provided by the TWDB. For remaining evaluation criteria, each RWPG shall determine the degree to which conditions have changed or new information has become

available and update the WMS and WMSP evaluations accordingly. All evaluation criteria shall also be met for newly identified WMSs and WMSPs.

Water conservation strategies, drought management strategies, and WMSs related to reducing water losses shall be considered along with all other categories of WMSs. Active water conservation strategies are those that conserve water over and beyond what would happen anyway as result of passive water conservation measures that stem from federal and state legislation requiring more efficient plumbing fixtures in new building construction. When evaluating and recommending WMSs and WMSPs, each RWPG shall:

1. consider active water conservation as potentially feasible WMSs for WUGs for which the water conservation requirements contained in TWC §11.1271 apply;
2. consider active water conservation strategies for WUGs and WWP WUG customers with identified needs;
3. document the reasons, if an RWPG does not recommend specific potentially feasible active conservation WMSs to meet needs for a specific WUG or WWP WUG customer;
4. if TWC §11.085(l) applies to a proposed IBT, include water conservation measures at the highest practicable level of water conservation and efficiency achievable (includes existing conservation as well as that proposed within a WMS) for each WUG or WWP WUG customer that is recommended to rely on a WMS involving the IBT; 39 and
5. present recommended conservation WMSs associated with an IBT WMS analysis by WUG and WWP WUG customers. Recommended conservation WMS information will be tabulated in a DB22 generated standardized report for each WUG with an associated recommended WMS that requires an IBT. This report shall be included in the IPP and final adopted RWP.

A separate subchapter (in accordance with 31 TAC §357.34(h)) shall consolidate and present all conservation recommendations for the RWPA.

RWPGs shall consider WMSs to address any issues identified in the information provided by the TWDB from the water loss audits performed by retail public utilities pursuant to 31 TAC §357.34(g)(2)(D).

RWPGs shall also consider drought management WMSs for each identified water need, and shall include drought management measures for each WUG to which TWC §11.1272 applies that are consistent with any applicable TCEQ guidance. Drought management strategies associated with Drought Management Plans also decrease water demand requirements similar to conservation WMSs, although there are some basic differences. For example, water conservation and drought management strategies differ in their longevity—conservation WMSs are generally implemented on a permanent basis, whereas drought management strategies are implemented on a temporary basis during times of severe drought or other emergencies that can limit existing water supplies. If, after considering drought management measures for each WUG with a need to which TWC §11.1272 does not apply, a RWPG does not select drought management as a WMS for an individual WUG with a need, they shall document the reason.

Documentation of the reason(s) why aquifer storage and recovery, seawater desalination, and brackish groundwater desalination WMSs were not recommended shall also be provided. This documentation of reasons may be included as shown in the Table E template of this guidance or elsewhere in the plan document as deemed appropriate by the RWPG.

Water quantities produced by recommended WMSs and WMSPs shall be based on water availability in accordance with Section 3. Additionally, WMSs shown as providing a supply in a planning decade, must come online in or prior to that initial decade year (31 TAC §357.10(21)). For example, if a WMS is shown as providing supply in the 2040 decade, it is assumed to come online in or prior to the year 2040. Given the immediacy of the WMS to deliver water by the initial year of the planning decade, WMSs and WMSPs given a 2020 decade during this planning cycle should be limited to those projects that can be constructed and delivering water within no more than 12 months from the statutory adoption deadline (January 5, 2022) of the state water plan. However, feasibility criteria defined<sup>40</sup> in SB 1511, 85<sup>th</sup> Legislative Session, shall inform the RWPG process for development of the 2021 RWP.

## ATTACHMENT NO. 2

### Plateau Region Potentially Feasible Water Management Strategies

County	Water User Group	Strategy Source Basin	Water Management Strategy
Bandera	City of Bandera	San Antonio	Reuse treated wastewater effluent for irrigation use
			Promote, design & install rainwater harvesting systems
			Additional Lower Trinity well and lay necessary pipeline
			Additional Middle Trinity wells within city water infrastructure
			Surface water acquisition, treatment and ASR (ALTERNATE)
	*Bandera County FWSD#1	San Antonio	New strategy - Additional groundwater well
	*Bandera County Other - Bandera River Ranch #1	San Antonio	Water loss audit and main-line repair
	*Bandera County Other - Lake Medina Shores	San Antonio	Additional groundwater wells
	*Bandera County Other - Medina WSC	San Antonio	Additional groundwater well for the Town of Medina
	Bandera County Other	San Antonio	Drought management (BCRAGD)
Additional groundwater well for Pebble Beach Subdivision			
Additional groundwater wells to provide emergency supply to VFD			
Water loss audit and main-line repair for Enchanted River Estates			
	Nueces	Drought management (BCRAGD)	
*Bandera County Irrigation	San Antonio	Additional groundwater wells	
*Bandera County Livestock	*Guadalupe	Additional groundwater well	
	*Nueces	Additional groundwater well	
Edwards	*City of Rocksprings	*Nueces	Additional groundwater well
	Edwards County Other - Barksdale WSC	Nueces	Additional groundwater well in the Nueces River Alluvium Aquifer
	Edwards County Other	Nueces	Vegetative Management
	*Edwards County Mining	*Nueces	Additional groundwater wells
		*Colorado	Additional groundwater wells
		*Rio Grande	Additional groundwater wells
Kerr	*City of Kerrville	Guadalupe	Increase wastewater reuse
			Water loss audit and main-line repair
			Purchase water from UGRA
			Increased water treatment and ASR capacity
	Kerr County Other - *Center Point	Guadalupe	*** EKCRWSP
	Kerr County Other - Center Point North WS	Guadalupe	*** EKCRWSP
	Kerr County Other - *Center Point Taylor System		*** EKCRWSP
	Kerr County Other - Hills and Dales Estate	Guadalupe	*** EKCRWSP
Kerr County Other - Nickerson Farm WS	Guadalupe	*** EKCRWSP	
Kerr County Other - Oak Forest South Water	Guadalupe	*** EKCRWSP	

**(continued) ATTACHMENT NO. 2**

**Plateau Region Potentially Feasible Water Management Strategies**

<b>County</b>	<b>Water User Group</b>	<b>Strategy Source Basin</b>	<b>Water Management Strategy</b>	
Kerr	Kerr County Other - Park Place Subdivision	Guadalupe	*** EKCRWSP	
	Kerr County Other - Pecan Valley	Guadalupe	*** EKCRWSP	
	Kerr County Other - Rustic Hills Water	Guadalupe	*** EKCRWSP	
	Kerr County Other - Verde Park Estates	Guadalupe	Water loss audit and main-line repair for Verde Park Estates *** EKCRWSP	
	Kerr County Other - Westwood WS	Guadalupe	*** EKCRWSP	
	*Kerr County Other	*Nueces	Conservation: Public information - Water shortage met with Guadalupe Basin strategies	
		Guadalupe	Water loss audit and main-line repair for Community Water Group WSC Vegetative management - UGRA	
	*Kerr County Irrigation	San Antonio	Additional groundwater well	
	*Kerr County Livestock	*Colorado	Additional groundwater wells	
		*Guadalupe	Additional groundwater wells	
		*San Antonio	Additional groundwater well	
		*Nueces	Additional groundwater well	
*Kerr County Mining	Colorado	Additional groundwater well		
Kinney	City of Brackettville	Rio Grande	Increase supply to Spoford with new water line Increase storage facility	
		Rio Grande	Water loss audit and main-line repair Increase storage facility	
	Kinney County Other	Rio Grande	Vegetative Management	
		Nueces	Vegetative Management	
Real	*City of Camp Wood	Nueces	Conservation: Public information Additional groundwater wells	
		Nueces	Additional groundwater well Develop interconnections between wells within the City	
	Real County Other	Nueces	Water loss audit and main-line repair for Real WSC Vegetative Management Additional groundwater well for Oakmont Saddle WSC	
		City of Del Rio	Rio Grande	Water loss audit and main-line repair Additional groundwater well Water treatment plant expansion Develop a wastewater reuse program
			Val Verde County Other	Rio Grande
*Val Verde County Mining	Rio Grande			Additional groundwater well

\* WUG with a supply need.

**\*\*\* Eastern Kerr County Regional Water Supply Project Strategies**

East Kerr County Regional Water Supply Project	Guadalupe	UGRA acquisition of surface water rights
		KCCC acquisition of surface water rights
		Construction of an off-channel surface water storage
		Construction of surface water treatment facilities and main distribution transmission lines
		Construction of an ASR facility
		Construction of a wellfield for dense rural areas
		Construction of a brackish groundwater desalination facility
		Construction of an Ellenburger Aquifer water supply source

## ATTACHMENT NO. 3

### Methodology for Identifying and Selecting Potentially Feasible Water Management Strategies

1. Review and consider recommended water management strategies adopted by the water planning group for the 2016 Plateau Region Water Plan.
2. Review and consider any issues identified in the most current TWDB Water Loss Audit Report, including leak detection and supply side analysis.
3. Solicit current water planning information, including specific water management strategies of interest from WUGs and WWP with identified needs.
4. Review and consider the most recent Water Supply Management, Water Conservation, and/or Drought Contingency Plans, where available, from WUGs and WWP with identified needs.
5. Consider potentially feasible water management strategies that may include, but are not limited to (*Chapter 357 Subchapter C §357.34*):
  - Extended use of existing supplies including:
    - a. System optimization and conjunctive use of water resources
    - b. Reallocation of reservoir storage to new uses
    - c. Voluntary redistribution of water resources including contracts, water marketing, regional water banks, sales, leases, options, subordination agreements, and financing agreements
    - d. Subordination of existing water rights through voluntary agreements
    - e. Enhancement of yields of existing sources
    - f. Improvement of water quality including control of naturally occurring chlorides
  - New supply development including:
    - a. Construction and improvement of surface water and groundwater resources
    - b. Brush control
    - c. Precipitation enhancement
    - d. Desalination
    - e. Water supply that could be made available by cancellation of water rights
    - f. Rainwater harvesting
    - g. Aquifer storage and recovery
  - Conservation and drought management measures including demand management
  - Reuse of wastewater
  - Interbasin transfers of surface water
  - Emergency transfers of surface water
6. Consider other potentially feasible water management strategies suggested by planning group members, stakeholders, and the public.
7. Based on the above reviews and considerations, establish a preliminary list of potentially feasible water management strategies. At a discussion level, consider the following feasibility concerns for each strategy:
  - Water supply source availability during drought-of-record conditions
  - Cost/benefit
  - Water quality
  - Threats to agriculture and natural resources
  - Impacts to the environment, other water resources, and basin transfers
  - Socio-economic impacts
8. Based on the above discussion level analysis, select a final list of potentially feasible water management strategies for further technical evaluation using detailed analysis criteria.

**ATTACHMENT NO. 4**

**Plateau Region Potential Strategy Scope of Work and Budget  
(TWDB-Formatted Spreadsheet)**