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Chapter 5A: Identification of Potentially Feasible Water Management Strategies

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APPENDICES

Appendix 5A-A: Screening Process for Potentially Feasible Water Management Strategies

Appendix 5A-B: Potentially Feasible Water Management Strategies



LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AFY	acre-feet
BMPs	best management practices
cfs	cubic feet per second
CWA	Clean Water Act
ETRWA	East Texas Regional Water Planning Area
ETRWPG	East Texas Regional Water Planning Group
ft	foot
ft/yr	foot per year
GPCPD	gallons per connection per day
GCDs	Groundwater Conservation Districts
GMAs	groundwater management areas
GPCD	gallons per capita daily
LNG	liquefied natural gas
MSA	Metropolitan Statistical Areas
MUD	Municipal Utility District
MWA	Municipal Water Authority
MWP	Major Water Provider
NRCS	National Resources Conservation Service
RWP	Regional Water Plan
RWPA	Regional Water Planning Area
RWPG	Regional Water Planning Group
SRA	Sabine River Authority
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TCF	trillion cubic feet
TPWD	Texas Parks and Wildlife Department
TTWP	Trans-Texas Water Program
TWDB	the Texas Water Development Board
USA	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMSs	Water Management Strategies
WUG	Water User Group
WWP	Wholesale Water Provider



5A IDENTIFICATION OF POTENTIALLY FEASIBLE WATER MANAGEMENT STRATEGIES

This chapter reviews the types of water management strategies (WMS) considered for the East Texas Regional Water Planning Area (ETRWPA) and the approach for identifying potentially feasible water management strategies for Water User Groups (WUGs) and Major Water Providers (MWP) with a water need, as identified in Chapter 4. In addition, evaluation criteria are considered, and the viability of each WMS type is assessed. Once a list of potentially feasible strategies has been identified, the most feasible strategies are recommended for implementation. An alternative strategy may also be identified as potentially feasible in the event a recommended strategy becomes infeasible.

The recommended and alternative water management strategies identified for individual WUGs and MWPs are presented in Chapter 5B. Chapter 5C discusses the conservation strategies and the application of each strategy to meet ETWPWA needs. WMSs to meet potential future demands that are not presently approved by the Texas Water Development Board (TWDB) are not included in this chapter.

Identification of a supply source for a potentially feasible strategy depends on the availability of the source, the accessibility of the source to the WUG or MWP developing the WMS, and the feasibility of developing a strategy from the source of supply. It should be noted that there can be potentially feasible strategies that are not identified as recommended or alternative WMS for an entity.

The types of WMSs considered in this chapter include water conservation, wastewater reuse, expanded use of existing supplies, new supply development, and drought management. A comprehensive list of the potentially feasible strategy types identified is included below:

- Water conservation
 - Water use reduction
 - Water loss control
- Drought Management
 - Demand management
- Wastewater reuse
- Management of existing supplies
 - Conjunctive use of groundwater and surface water
 - Acquisition of available existing supplies
 - Development of regional water supply or regional management of water supply facilities
 - Voluntary transfer of water resources (regional water banks, sales, leases, options, subordination agreements, and financing agreements)
 - Interbasin transfers
 - Emergency transfer of water under Texas Administrative Code §11.139
 - System optimization, reallocation of reservoir storage to new uses, contracts, water marketing, enhancement of yield, improvement of water quality
- New supply development
 - Surface water resources



- Groundwater resources
- Brush control; precipitation enhancement
- Rainwater harvesting
- Desalination of marine seawater or brackish groundwater
- Aquifer storage and recovery
- Cancellation of water rights

Drought management measures provide a safety factor for water users during drought, but are generally not a reliable, firm source of additional supplies to meet growing demands. For this reason, the East Texas Regional Water Planning Group (ETRWPG) does not recommend using drought management measures as potentially feasible WMSs for regional water planning. Chapter 7 includes an analysis and summary of drought response data, activities, and drought management recommendations in the ETRWPA.

Desalination (marine seawater or brackish groundwater) and aquifer storage and recovery (ASR) were considered WMSs by the ETRWP on a case-by-case basis. For the 2026 ETRWP, no Major Water Providers (MWP), Water User Groups (WUGs), or other entities in Region I are planning on sponsoring desalination or ASR as a recommended or alternative strategy. In future planning cycles, if any Region I entities would like to include a desalination or ASR project in the East Texas Regional Water Plan (ETRWPA), the ETRWPG will evaluate these project(s) in accordance with the categories identified in Texas Administrative Code Title 31 Chapter 357.34.

While several strategy types were considered by the ETRWPA, not all were determined as viable options for addressing water needs in the region. The subcategories within each strategy type that were determined as potentially feasible strategies for entities within the ETRWPA for this round of regional water planning include: 1) water conservation 2) wastewater reuse 3) expanded use of existing supplies (e.g., voluntary transfers, regional water supply facilities, interbasin transfers), and 4) new supply development (new groundwater and surface water supply development). More detailed information regarding the process for screening potentially feasible water management strategies in the ETRWPA is included in Appendix 5A-A.

The sections below include a detailed discussion of each one of these four main strategy types, their subtypes, and consideration of the potential feasibility of these strategies to WUGs and MWPs in the ETRWPA.

5A.1 WATER CONSERVATION

Water conservation is defined as methods and practices that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses. Water conservation is typically viewed as long-term changes in water use that are incorporated into daily activities.

Water conservation is a valued water management strategy in the ETRWPA because it helps extend the timeline for the need of additional water management strategies in the region. A new requirement from the 2026 RWP distinguishes water conservation into two separate categories: water use reduction and water loss mitigation. Water use reduction is recommended only for municipal WUGs with baseline GPCDs above their associated thresholds based on their population group. On the other hand, water loss mitigation is recommended for all municipal WUGs, as it is considered a best management practice by the



ETRWPG. Although the ETRWPG does not prescribe specific conservation measures for non-municipal WUGs, it strongly recommends that these WUGs implement water conservation measures. Doing so can contribute to the sustainability of water resources and ensure long-term availability, especially as water scarcity becomes more severe.

5A.2 WASTEWATER REUSE

Water reuse utilizes treated wastewater effluent as either a replacement for a potable water supply (direct reuse) or utilizes treated wastewater that has been returned to a water supply resource for non-potable reuse or additional treatment at a later time for potable or non-potable purposes (indirect reuse).

Water reuse is most feasible for larger municipal water users or industrial users that have access to a source of municipal effluent. In the ETRWPA, small quantities of wastewater are currently being reused where it is economically viable. The ETRWPG identified only a few additional reuse opportunities within the region because the generators of the wastewater effluent were not generally interested in developing this type of project due to the lack of need or excessive cost compared to other alternatives.

Currently, there are two potentially feasible wastewater reuse strategies identified in the ETRWPA for the 2026 Plan: (1) a transmission system transferring the City of Center’s wastewater return flows from their wastewater treatment plant to an industrial customer; (2) Athens Municipal Water Authority (AMWA) reusing water returned from the Texas Parks and Wildlife (TPWD) Texas Freshwater Fisheries Center (TFFC) to Lake Athens.

AMWA’s water right permit allows the City of Athens to convey and discharge wastewater effluent into Lake Athens. The City and the AMWA have decided not to pursue this strategy at this time due to the cost. However, AMWA is pursuing entering into a contract with the TFFC to return water that is passed through its facility back to Lake Athens. Currently, the TFFC fish hatchery returns this water as part of its operations, but it is under no contractual obligation to do so. For the purposes of regional water planning, water returned to Lake Athens from the TFFC fish hatchery is not considered an existing supply, so it is considered as a potentially feasible strategy.

5A.3 MANAGEMENT OF EXISTING SUPPLIES

As a water-rich region, the water needs experienced by WUGs and MWP’s within the ETRWPA can often be addressed by the management of existing sources of supplies (both groundwater and surface water), adding or updating infrastructure to access an existing source of supply, and through voluntary transfers of existing supplies. As a result, many of the potentially feasible strategies for the ETRWPA are associated with the management of existing supplies. The introduction to this chapter includes a comprehensive list of subcategories identified within the management of existing supplies strategy type. However, not all subcategories were deemed viable as potentially feasible strategy types for the 2026 ETRWP. The primary subcategories within this strategy type determined to have potentially feasible strategies for entities within the ETRWPA for this round of planning are: 1) voluntary redistribution, 2) regional water supply facilities and management of facilities; and 3) interbasin transfers. Subsections 5A.3.1 – 5A.3.3 include a detailed discussion on each one of the subcategories.

5A.3.1 Voluntary Transfer

For purposes of this Plan, “voluntary transfer” is defined as an entity in possession of water rights or water purchase contracts freely selling, leasing, giving, or otherwise providing water to another entity. Typically, the entity providing the water has determined it does not need the water to meet its own demand for the duration of the transfer. The transfer of water could be for a set period of years or a permanent transfer. Voluntary transfer is essentially a purchase of water.

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Voluntary transfers have many benefits over other supply options, like new supply development, because it can be much easier than implementing a new water supply project, it typically costs less than large capital projects, and it avoids implementation issues of large projects like reservoirs that can have substantial environmental and local impacts. Most importantly, the transfer of water makes use of existing resources and provides a more immediate source of water.

Entities were identified that have the potential to meet demands through voluntary transfers, either by having available supplies or currently providing needs through voluntary transfers and having the ability to obtain new supplies. It should be noted the ETRWPA region is a water rich region. The water needs for the WUGs and MWP in the region primarily exist due to infrastructure limitations or due to lack of water supply availability for the WUG with the need. There are other MWPs and WUGs in the region with excess supplies that can be used to address the water needs in the region. Due to this, voluntary transfer of water is an important strategy type used for identifying WMSs for the ETRWPA. It is important to remember transfer of water is voluntary. No group or individual is required to participate. Therefore, voluntary transfer strategies should be identified where the supply transfer would not place a burden on the water provider (seller).

Table 5A.1 includes a list of entities considered as potential suppliers of voluntary transfer(s) as a strategy and the estimated existing supply amounts they have available to distribute to other entities. This does not consider potential supplies from future water management strategies that could be voluntarily transferred. The amounts shown represent the minimum amount of supply available during the planning period for voluntary transfer after all other obligations from existing customer contracts and/or demands are met. Additionally, this table includes a list of WUGs and MWPs that are identified to receive water through these voluntary transfers. Most of these WUGs and MWPs identified as recipients of voluntary transfers are identified to have water supply needs across the planning period. There are other potential suppliers in the ETRWPA with surplus existing supplies that could be considered for voluntary transfers, but those suppliers are generally located further from where water needs were identified in the region.



Table 5A.1 Entities with Voluntary Transfer Identified as a Water Management Strategy

Water Provider (Supply Source)	Water Provider Existing Supply Available for Voluntary Transfer ^a (ac-ft/yr)	Entities Receiving Water from Provider (County)
City of Lufkin (Lake Kurth, Carrizo-Wilcox Groundwater)	23,612	Manufacturing (Angelina)
Lower Neches Valley Authority (Sam Rayburn/B.A. Steinhagen Reservoir System, Neches Run-of-River)	756,884	Manufacturing (Jasper)
		Manufacturing (Jefferson)
		Beaumont (Jefferson)
		Trinity Bay Conservation District (Jefferson)
Sabine River Authority of Texas (Toledo Bend Reservoir, Sabine Run-of-River)	889,745	Lower Neches Valley Authority
City of Tyler (Lake Tyler, Lake Palestine)	8,615	Chandler (Henderson)
		Southern Utilities (Henderson)
		County-Other (Smith)
		Manufacturing (Smith)
		Mining (Smith)

a. Estimated existing supply available over the planning period (2030 to 2080) after accounting for existing contracts and/or demands from customers.

An issue facing a voluntary transfer is proper compensation for the entity or individual that owns the water right or contract for water. If an entity has arranged through contracts to have more water than they currently need or may need in the study period, they should be compensated for the expense and upkeep of any facilities already in place. The following issues should be considered when negotiating a voluntary transfer agreement:

- Quantity of water to be transferred;
- Location of excess water supply;
- Location of buyer with water need;
- Necessary water treatment and distribution facilities;
- Determination of fair market value;
- Consideration of how existing contracts will affect the sale or lease;
- Length of agreement;
- Expiration dates of agreement;
- Drought contingencies;



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- Protections needed by entity providing water;
- Protections needed by entity needing water;
- Enforcement of protections, and
- Other conditions specific to buyer and seller.

5A.3.2 Regional Water Supply Facilities

The ETRWPA contains several Major Water Providers (MWP) that manage regional water supply facilities to serve their customers. Many of these MWPs have existing water supply sources (e.g., reservoirs, run-of-river, groundwater) that they own and have permits to use, but need to develop either new or additional regional facilities to tap into these sources. In addition, due to the ETRWPA being a water rich region, there may also be opportunities for one or more entities to develop regional water facilities to utilize existing supply sources that have not yet been fully developed. Given these considerations, development and management of regional water supply facilities is identified as a viable, potentially feasible water management strategy in the ETRWA.

For this strategy type, potentially feasible water supply options were primarily identified based on information provided by specific sponsors. For example, several sponsors identified new regional facilities (e.g., water treatment plants, pump stations, distribution systems, etc.) that they plan to develop during the planning period. Table 5A.2 includes a list of entities and the associated regional facility strategies/projects identified in the ETRWPA.

Table 5A.2 Regional Water Supply Facilities Identified as a Water Management Strategy

Sponsor	Regional Water Supply Facility Strategy/Project
Athens MWA	Water Treatment Plant Booster Pump Station Expansion
Angelina Neches River Authority	Lake Columbia Treatment and Distribution System
Beaumont	New Westside Surface Water Treatment Plant
Lower Neches Valley Authority	Devers Pump Station Relocation (Region H)
	Neches Pump Station Upgrades and Fuel Diversification
Lufkin	Facilities to Transfer from Sam Rayburn to Lake Kurth
Tyler	Lake Palestine Infrastructure Expansion
Nacogdoches County	Lake Naconiche Regional Water Supply System

5A.3.3 Interbasin Transfer

The ETRWPA spans three major river basins: the Neches, Trinity, and Sabine. In each river basin in the ETRWPA, particularly the Sabine and Neches, there are several major supply reservoirs and run-of-river diversions with supplies that have not yet been fully utilized. Interbasin transfers may be a potentially feasible water management strategy for water suppliers with sufficient water supplies to transfer outside of their basin and users in other basins that have water supply needs.

An interbasin transfer requires a permit through the Texas Commission on Environmental Quality (TCEQ). Recommended water management strategies that involve an IBT are administered under Section 11.085



of the Texas Water Code, which includes several requirements to obtain necessary permits such as:

- Providing the cost of water, category of use and proposed users, and cost of diverting, conveying, distributing, supplying, and treating the water for proposed users.
- Conducting required public meetings in the basin of origin and the receiving basin.
- Providing notice of an application to permit holders, county judges, city mayors, and groundwater conservation districts in the basin of origin, and state legislators in both basins.
- Publishing notice of application in newspapers of general circulation in each county in both basins.
- Consideration of comments received through the permit application's public process.

In granting the permit, consideration will be given to:

- The need for water in the basin of origin and receiving basin.
- The availability of alternative water supplies to the receiving basin.
- The purpose of use for the water in the receiving basin.
- Proposed methods for avoiding waste and implementing water conservation and drought contingency measures.
- Proposed methods to put transferred water to beneficial use.
- The projected economic impacts.
- Impacts to existing water rights, instream uses, water quality, aquatic and riparian habitat, and bays and estuaries.
- The proposed mitigation to the basin of origin.
- The continued need to use the water for purposes under the existing water right, if an amendment to an existing water right is sought.

Finally, the commission may grant the application only to the extent that:

- The detriments to the basin of origin are less than the benefits to the receiving basin.
- The applicant has prepared a drought contingency plan and has developed and implemented a water conservation plan that will result in the highest practicable level of conservation and efficiency.

Additional environmental permitting may also be required for the development of infrastructure, including but not limited to:

- U.S. Army Corps of Engineers Section 404 Permit and mitigation plan.
- National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS).
- Cultural Resources Survey and National Register of Historic Places (NRHP) testing.
- Ancillary studies as directed by the Texas Parks and Wildlife (TPWD) and U.S. Fish and Wildlife Service (USFWS).

Table 5A.3 summarizes the interbasin transfer of surface water strategies sponsored by entities in the ETRWPA that are identified as potentially feasible. Some of these strategies involve development of new surface water supplies, which are described in Section 5A.4.2.



Table 5A.3 Interbasin Transfers Identified as a Water Management Strategy

Sponsor	Strategy	Originating Basin	Receiving Basin
Angelina Neches River Authority	Lake Columbia	Neches	Sabine, (Potentially Trinity) ^(a)
Lower Neches Valley Authority	Neches-Trinity Interconnect	Neches	Trinity
	Purchase from SRA	Sabine	Neches
Upper Neches River Municipal Water Authority	Neches Run-of-River with Lake Palestine	Neches	Trinity

Note: (a) New London is a contracted customer of Lake Columbia, who is located in the Sabine Basin. A few WUGs in Trinity Basin in Region C are potential customers.

As illustrated in Chapter 3 and 4, several Major Water Providers in the ETRWPA have substantial surpluses of water supply. Other water planning regions have identified interbasin transfer of surface water supplies originating from sources in the ETRWPA as potentially feasible water management strategies. These strategies would be sponsored by entities outside of the ETRWPA and these sponsors would need to enter into an agreement with the MWP in the ETRWPA that own the right to the originating source. Since these are not strategies sponsored by entities in the ETRWPA, they are not identified or evaluated as strategies in the 2026 ETRWP. Discussion of these water management strategies can be found in the respective regional water plans where the receiving sponsor entity is located.

5A.4 NEW SUPPLY DEVELOPMENT

Development of new water supplies is a viable water management strategy in the ETRWPA for entities looking to expand an existing source (e.g., groundwater) to meet their water supply needs, or entities planning to increase the quantity of their reliable supplies to meet future demands and/or serve as a buffer against uncertainty. New supply development can include sources of supply developed historically in the ETRWPA, such as surface water or groundwater, or alternative methods that have been implemented in other areas of the state but have not yet been developed in the ETRWPA like aquifer storage and recovery (ASR) or desalination (marine or brackish groundwater). Several new groundwater and surface water development strategies are identified as potentially feasible in the ETRWPA. ASR and desalination strategies would likely be large-scale projects that could serve local or regional entities. The ETRWPG will consider these strategies on a case-by-case basis as sponsors indicate plans for development. During this round of regional water planning, no entities in the ETRWPA indicated they were planning to develop either ASR or desalination strategies, so none were identified in the 2026 ETRWPG.

5A.4.1 Groundwater Development

Groundwater is a viable and cost-effective supply source for the ETRWPA. The majority of WUGs in the ETRWPA with an identified need during the planning period are expected to continue using groundwater as the source of their water supplies. The supplies established in Chapter 3 were used to evaluate the ability to meet demands for the ETRWPA.

Under the Joint Planning effort for groundwater, the Groundwater Conservation Districts (GCDs) determine the appropriate protective level through the adoption of the Desired Future Conditions (DFCs). The desired future conditions are incorporated into regional planning through the Modeled Available

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Groundwater (MAG) values. In the ETRWPA, counties that are projected to be near the limit of the Modeled Available Groundwater estimates for major and/or minor aquifers are Henderson, Jasper, Panola, Rusk, San Augustine, Shelby, and Smith counties. There are no recommended strategies that involve quantities that exceed the Modeled Available Groundwater values, thus providing the necessary environmental and water supply protections desired by the GCDs. Table 5A.4 below includes a region-wide summary of undeveloped groundwater supplies by aquifer that can be utilized for potential WMSs.

Table 5A.4 Summary of Undeveloped Groundwater Supplies in the East Texas Regional Water Planning Area

Source of Supply	2030	2080
Groundwater Supplies		
Carrizo Wilcox Aquifer	46,158	44,267
Gulf Coast Aquifer	139,834	140,023
Queen City Aquifer	56,971	57,187
Yegua-Jackson Aquifer	24,609	24,729
Other Aquifer	2,133	2,139
Sparta Aquifer	911	1,021

Development of additional groundwater supply was identified as a potentially feasible strategy for several WUGs with identified needs. Additionally, during outreach efforts by the ETRWPG and consultant team, some WUGs without identified needs (B C Y WSC, China, Gaston WSC, Orange County WCID 1, South Jasper County WSC) indicated that they plan to expand their groundwater supply in the future. Development of groundwater was also considered as a potentially feasible strategy for these WUGs. A summary of entities where development of additional groundwater is identified as a potentially feasible water management strategy is presented by aquifer and county in Table 5A.4.

Table 5A.5 Entities with Groundwater Development Identified as a Water Management Strategy

County	Carrizo Wilcox Aquifer	Gulf Coast Aquifer	Queen City Aquifer	Yegua Jackson Aquifer
Anderson	B C Y WSC	None	None	None
	Steam Electric Power			
Cherokee	Alto Rural WSC	Beaumont	None	None
Hardin	None			
Henderson	Athens MWA	None	Mining	None
	Chandler			
	None			
Houston	Houston County WCID #1	None	None	None
	Livestock			
	TDCJ Eastham Unit			
Jasper	None	South Jasper WSC	None	None
Jefferson	None	China		



County	Carrizo Wilcox Aquifer	Gulf Coast Aquifer	Queen City Aquifer	Yegua Jackson Aquifer	
Nacogdoches	D&M WSC	None			
Orange	None	Orange County WCID 1			
Panola	Elysian Fields WSC	None			
Rusk	Gaston WSC				
	Jacobs WSC				
Sabine	None	Manufacturing			Livestock
Trinity		Irrigation			
Tyler		None			
					None

5A.4.2 Surface Water Development

Surface water comprises most of the existing water supply in the ETRWPA. Surface water supply sources include reservoirs and river diversions, known as run-of-river supplies. Overall, there are 13 water supply reservoirs in the Neches River Basin, six water supply reservoirs in the Sabine River Basin, one water supply reservoir in the Trinity River Basin, and numerous run-of-river diversions. Development of new surface water supplies through new reservoirs or surface water system optimization is identified to be a viable option in the ETRWPA to meet projected future demands.

5A.4.2.1 New Reservoirs

Water suppliers in the ETRWPA have performed numerous studies on locations of reservoir sites. The ETRWPA possesses many features attractive to reservoir construction. The process of implementing a new reservoir is a multi-decade task of identifying, evaluating, and resolving environmental impacts associated with the reservoir as well as evaluating the economic feasibility of the project. These studies are beyond the scope of regional water planning. The process of implementation can go beyond the 50-year planning cycle in the current water planning process. The consideration of reservoir projects in the ETRWPA is based on information provided by MWPs located in the ETRWPA and demonstrates their ability and willingness to serve needs in the 50-year planning cycle. For proposed reservoirs, justification and environmental impact analyses are the responsibility of the sponsoring water provider. Information available through other studies was used to evaluate these projects for the region.

The ETRWPA has a long history of water supply planning by means of reservoir development. Numerous sites have been identified as being hydrologically and topographically ideal for reservoir development. For a site to be considered for reservoir development, it needs to be recommended by the planning group as a unique reservoir site. Two sites in the ETRWPA are currently designated as unique reservoir sites: Lake Columbia and Lake Fastrill. Lake Fastrill was designated by the 79th Legislature through 2007 Texas Legislature Senate Bill 3. Lake Columbia received its unique designation by the State Legislature, Senate Bill 1362. Lake Columbia is currently being pursued for development. The ETRWPG recommends both Lake Columbia and Lake Fastrill retain their status as unique reservoir sites. Chapter 8 provides an additional discussion of unique reservoir sites.

Several reservoir sites in the ETRWPA have long been discussed as potential sources of water. The ETRWPG recognizes reservoirs can have major impacts on the environment and protection of the environment is already afforded through a process that is more thorough than the regional water planning effort. Other sites have been considered for water supply development in the past and may be considered again for future supplies. The potential reservoirs initially considered for water supply are presented



below in Table 5A.6. Chapter 8 features a brief description of each of the potential reservoir sites.

Table 5A.6 Potential Reservoirs for Designation as Unique Reservoir Sites

Sponsor	Reservoir Site
Angelina Neches River Authority	Lake Columbia (Already Unique Site)
Lower Neches Valley Authority	Rockland Reservoir
Sabine River Authority	Big Cow Creek
	Bon Weir
	Carthage Reservoir
	Kilgore Reservoir
	Rabbit Creek
	State Hwy. 322, Stage I
	State Hwy. 322, Stage II
	Stateline
	Socagee
Upper Neches River Municipal Water Authority	Fastrill Reservoir (Already Unique Site)

For this plan, Lake Columbia is identified as the most feasible new reservoir from this list. The Lake Columbia footprint is located predominantly in Cherokee County but extends into the southern portion of Smith County. The reservoir would be formed by the construction of a dam on Mud Creek approximately 2.5 miles downstream of U.S. Highway 79 crossing. The dam is expected to impound water approximately 14 miles upstream with an estimated surface of 10,133 acres. The firm yield for the reservoir site is 75,720 ac-ft with a total storage volume at normal pool elevation of 315 feet, mean sea level (msl) or 195,500 ac-ft. This project is sponsored by Angelina and Neches River Authority.

Needs that would potentially be met by the development of Lake Columbia are provided in Table 5A.7. In addition, Lake Columbia is a recommended strategy for all participants in the project. Some participants intend to replace existing groundwater supplies with water from Lake Columbia. These users may or may not show a need in the 2026 Plan.

Table 5A.7 List of Participants for the Lake Columbia Project

Entities Participating in Lake Columbia Project	Contracted Amount (ac-ft/yr)
Currently Contracted Participants	
Afton Grove WSC, Stryker Lake WSC	3,848
Jacksonville	4,275
New Summerfield	2,565
North Cherokee WSC	4,275
Rusk	4,275
Rusk Rural WSC	855
City of Alto	428
Caro WSC	428
Nacogdoches	8,551
New London	855
Troup	4,275



Entities Participating in Lake Columbia Project	Contracted Amount (ac-ft/yr)
Arp	428
Blackjack WSC	855
Jackson WSC	855
Whitehouse	8,551
Potential Participants	
Region C	Up to 56,050
TOTAL	75,720

Additionally, the Lower Neches Valley Authority (LNVA) is planning to construct a new 1,100 acre, off-channel reservoir located on the northwest end of Beaumont in Jefferson County. This reservoir is referred to as the West Beaumont Reservoir. The reservoir is anticipated to have an approximate capacity of 7,700 acre-feet, which could supply a minimum of 10 days of storage that could be utilized to serve LNVA’s customers in case of flood inundation or loss of power at their pump stations. This reservoir is located so that stored water can be provided to customers across the LNVA system during disaster events, including the cities of Port Arthur, Groves, Nederland, Port Neches, West Jefferson County MUD, Beaumont, and other agricultural and industrial customers throughout Jefferson County. The West Beaumont Reservoir is also considered as a potentially feasible strategy in the ETRWPA.

In comparison to the reservoir sites previously listed that are on-channel impoundments, the West Beaumont Reservoir utilizes off-channel storage and has a smaller footprint. As a result, it is anticipated to have a lesser impact to the environment in comparison the reservoir sites listed in Table 5A.6. Furthermore, filling the West Beaumont Reservoir will utilize LNVA’s existing water right authorizations, which account for existing environmental flow standards.

5A.4.2.2 Other New Surface Water Development

The Upper Neches River Municipal Water Authority (UNRMWA) is identified to have water supply needs relative to the water contracted from the Lake Palestine system. UNRMWA has evaluated multiple potentially feasible water management strategies. UNRMWA was the sponsor of the proposed Lake Fastrill project. With the uncertainties surrounding the Lake Fastrill project, the UNRMWA in conjunction with the City of Dallas identified the need for a Lake Fastrill replacement project.

In 2013, UNRMWA and Dallas initiated the Upper Neches River Water Supply Project Feasibility Study (HDR, 2014) to evaluate potential water supply strategies to replace the Lake Fastrill project. These strategies included Neches run-of-river diversions of unappropriated water from the Upper Neches River operated in system with Lake Palestine, tributary storage, and/or operated conjunctively with groundwater. The additional water supply provided by these strategies could be used to supplement existing water supplies available to Dallas and potentially other UNRMWA customers. Compared to the Lake Fastrill project, all run-of-river diversion strategies provide lesser firm yield but avoid environmental impacts and some of the permitting challenges associated with a large, main-stem reservoir on the Neches River. Based on this study, the recommended strategy was the Neches run-of-river diversion operated as a system with Palestine. This was included as a recommended WMS/WMSP for UNRMWA and Dallas in the 2021 regional water plans. The Draft 2024 Dallas Long Range Water Supply Plan (LRWSP; Dallas Water Utilities, 2024) re-evaluated this strategy and again designated the Neches run-of-river diversion operated as a system with Lake Palestine as a recommended strategy. The re-evaluated configuration of this strategy from the Draft 2024 Dallas LRWSP is identified as a potentially feasible strategy for the 2026 ETRWP.



5A.4.3 Aquifer Storage and Recovery (ASR)

Aquifer storage and recovery (ASR) involves storing water in aquifers and retrieving this water when needed. The water to be stored can be introduced through enhanced recharge or more commonly injected through a well into the aquifer. If an injection well is used, Texas law requires that the water not degrade the quality of the receiving aquifer. Source water for ASR can include excess surface water, treated wastewater, or groundwater from another aquifer.

There are several technical considerations to determine the feasibility and applicability of ASR, specifically:

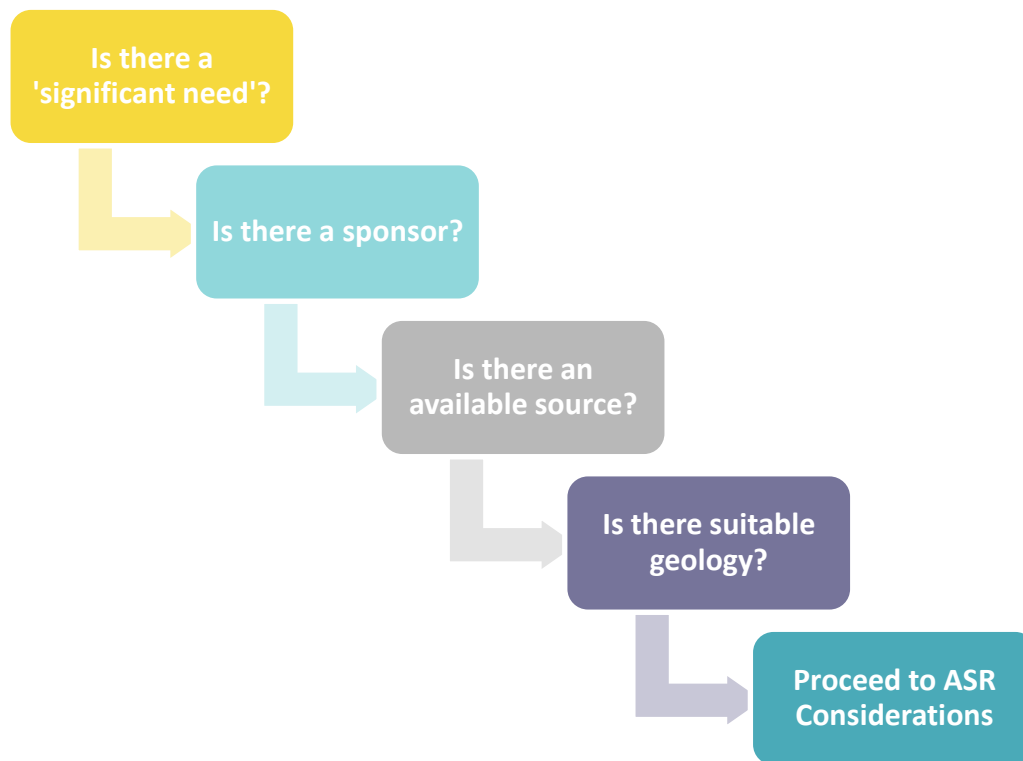
- ASR requires suitable geological conditions for implementation. Since geologic conditions vary by location, studies must be performed to determine what specific locations would be suitable for ASR.
- Raw surface water and wastewater reuse most likely will require pretreatment prior to injection.
- Operation of an ASR system could significantly impact the amount of water that is retrievable.

Recent legislation passed by the 86th Texas Legislature, and signed by the Governor on June 10, 2019, requires the regional water plans to consider ASR and provide a specific assessment of this strategy if the region has significant needs. The definition of significant need is deferred to each region. The ETRWPG defined the threshold for significant needs to be 5,000 acre-feet per year. There are five entities that meet this significant need threshold: the Angelina & Neches River Authority (ANRA), the City of Beaumont, Upper Neches River Municipal Water Authority (UNRMWA), Jasper County Manufacturing, Jefferson County Manufacturing.

Before assessing the multitude of technical considerations required for ASR, Region I developed a set of criteria to screen out the feasibility and applicability of ASR to the entities identified with significant needs. Figure 5A.1 illustrates this screening process.



Figure 5A.1 Aquifer Storage and Recovery Screening Criteria



All five entities identified with a significant need in Region I are evaluating and implementing other feasible strategies to meet these needs (see their respective sections in Chapter 5B) and are not planning on sponsoring an ASR strategy to be included in the 2026 ETRWP. As a result, each entity identified with a significant need in Region I did not pass the second criteria assessed in the screening process and ASR was not further evaluated and recommended as a strategy for these entities.

5A.4.4 Potentially Feasible Strategies with Potential Flood Mitigation Benefits

In accordance with TWDB requirements, RWPGs must identify potentially feasible water management strategies, if any, that could potentially provide non-trivial flood mitigation benefits or that could be combined with flood mitigation features to provide both water supply and flood mitigation benefits. The ETRWPG reviewed each potentially feasible water management strategy and project identified in the ETRWPA during this planning cycle and it was determined that none could measurably provide flood mitigation benefits. Furthermore, none of these WMSs would negatively impact flood mitigation efforts.

The Texas Legislature passed Senate Bill 8 in 2019, which created Texas’ first statewide regional flood planning program and tasked the TWDB with administering the process. In 2020, the TWDB established 15 regional flood planning areas (RFPAs) that correspond to major river basins across Texas. Similar to regional water planning, each region is served by regional flood planning groups (RFPGs) comprised of appointed members that represent key public interests. The ETRWPA intersects three RFPAs: the Neches (Region 5), Sabine (Region 4), and Trinity (Region 3). As part of the first round of Regional Flood Plans, adopted in March 2024, each RFPG examined whether any of their recommended flood mitigation strategies (FMSs) or flood mitigation projects (FMPs) had the potential to provide a water supply benefit. The ETRWPG reviewed relevant 2024 Regional Flood Plans and found that no FMSs or FMPs were determined to impact and/or measurable benefit to water supply, water availability, or strategies in the



ETRWPA. It is therefore determined that the potential for strategies or projects with a combined water supply and flood mitigation benefit within the ETRWPA is limited.

5A.4.5 Summary of Potentially Feasible Strategies

Potentially feasible water management strategies were identified for Water User Groups and Major Water Providers across the ETRWPA. These strategies include a wide assortment of strategy types, which were carefully reviewed for entities with identified needs. While some strategies were determined not to be potentially feasible at this time, the ETRWPG supports the research and development of new and innovative technologies for water supply. With continued research, new technologies will become more reliable and economical for future users and may be applicable for water suppliers to serve the water needs in the region.

The process for identifying potentially feasible water management strategies was presented at the ETRWPG meeting in Nacogdoches, Texas on February 15, 2024. There were no public comments and ETRWPG approved the methodology. A list of the potentially feasible water management strategies considered for the ETRWPA is included in Appendix 5A-B. The process for strategy development and evaluation is presented in the following sections.

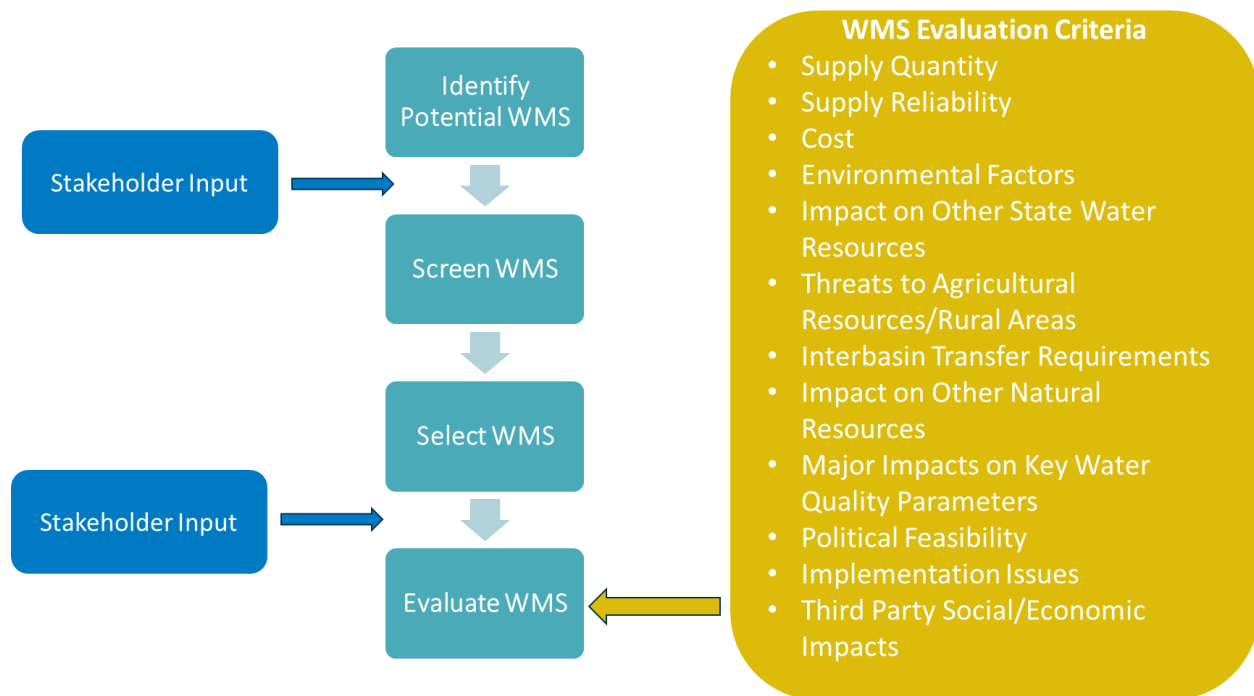
5A.5 SELECTION AND EVALUATION OF WMS

The consideration and selection of water management strategies for water user groups with needs followed TWDB guidelines and were conducted in open meetings with the ETRWPG. Potentially feasible strategies are evaluated in accordance with state guidance. A summary of the process for selection and evaluation of the WMSs is described as follows and is illustrated in Figure 5A.2:

- 1) Define groupings or common areas with supply deficiencies.
- 2) Develop a comprehensive list of potentially feasible strategies, per screening process.
- 3) Contact potential suppliers/WUGs to determine current strategies under consideration.
- 4) Select one or more strategies as appropriate for each need or group.
- 5) Contact each entity with a need and confirm the selected strategies are acceptable.
- 6) Present proposed WMSs to the ETRWPG in a public meeting for discussion, modification, and approval.
- 7) Document and evaluate proposed WMSs. This evaluation includes quantitative rating based evaluation categories including quantity, reliability, cost, environmental factors, impacts on other water resources, impacts on agricultural and natural resources, third party social and economic impacts of moving water from rural/agricultural areas, sponsorship, and political acceptability for the various strategies.



Figure 5A.2 Process to Select and Evaluate Water Management Strategies



In accordance with Texas Administrative Code Title 31 Chapter 357.34€, potentially feasible water management strategies are evaluated across the following categories:

- **Quantity:** Quantity is the amount of water the strategy would provide to the respective entity in acre-feet per year on a reliable basis. This amount is considered with respect to the user’s short-term and long-term shortages.
- **Reliability:** Reliability is an assessment of the availability of the specified water quantity to the user over time. If the quantity of water is available to the user all the time, then the strategy has a high reliability. If the quantity of water is contingent on other factors, reliability will be lower.
- **Cost:** The assessment of cost for each strategy is expressed in dollars per acre-foot per year (unit cost) for water delivered and treated for the end user requirements. Calculations of these costs follow the TWDB guidelines for cost considerations and identify total capital cost and annual costs by decade. Project capital costs are based on September 2023 price levels and include construction costs, engineering, land acquisition, mitigation, right-of-way, contingencies and other project costs associated with the respective strategy. Annual costs include power costs associated with transmission, water treatment costs, water purchase (if applicable), operation and maintenance, and other project-specific costs. Debt service for non-reservoir strategies are calculated over 20 years at a 3.5 percent interest rate and for reservoir projects are calculated over 40 years at a 3.5 percent interest rate.
- **Environmental factors:** Potential impacts to sensitive environmental factors were considered for each strategy. Environmental factors include environmental water needs, wildlife habitat, cultural resources, and bays, estuaries, and arms of the Gulf of Mexico. Unless a specific location of a



strategy was identified and a previous study was conducted to assess environmental impacts, a detailed evaluation could not be completed. Therefore, a more detailed environmental assessment will be required before a strategy is implemented.

- **Impacts on other state water resources:** The impact on water resources considers the effects of the strategy on water quantity, quality, and use of other existing water resources or potential water management strategies. A water management strategy may have a positive or negative effect on other water resources.
- **Impacts to agricultural resources:** A water management strategy could potentially impact agricultural production or local natural resources. Impacts to agriculture may include reduction in agricultural acreage, reduced water supply for irrigation, or impacts to water quality as it affects crop production.
- **Impacts to natural resources:** The impacts to natural resources may consider inundation of parklands, impacts to exploitable natural resources (such as mining), recreational use of a natural resource, and other strategy-specific factors.
- **Third-party social and economic impacts of moving water:** This considers the potential third-party social and economic impacts resulting from voluntary distributions of water, including moving water from rural and agricultural areas.
- **Impacts on key parameters of water quality:** Implementation of certain water management strategies could potentially impact both physical and chemical characteristics of water resources in the region. Potential impacts to key water quality parameters in the region from a water management strategy were assessed, where applicable.

In the ETRPWA, the evaluation of strategies also considers issues associated with interbasin transfers, sponsorship, and potential implementation issues, where applicable.

Chapter 5B and its appendices include more detailed assessments of WMSs across the identified evaluation categories. For example, Appendix 5B-A contains technical memorandums for each recommended water management strategy in the ETRPWA. Each technical memorandum includes a description of the impact of WMSs and a quantitative rating with regard to the identified evaluation categories. Appendix 5B-B provides a summary of the methodology behind the quantitative rating system for each evaluation category and a matrix summarizing the ratings for each category quantified for all WMSs.

Appendix 5A-A

Screening Criteria for Potentially Feasible Water Management Strategies

Appendix 5A-A documents the screening process used to assess the feasibility of potential water management strategies (WMS) in the East Texas Regional Planning Area (ETRWPA).



Appendix 5A-A

Screening Process for Potentially Feasible Water Management Strategies

The screening process used to assess the feasibility of potential water management strategies (WMS) in the East Texas Regional Planning Area (ETRWPA) are provided as follows. This process was adopted as guidelines, and strategies could be retained or dismissed at the discretion of the East Texas Regional Water Planning Group (ETRWPG).

5A-A.1 GENERAL GUIDELINES

The ETWPWG identified a series of general guidelines when considering the potential feasibility of WMSs for the region. The guidelines are as follows:

- Feasible strategy must have an identified sponsor or authority.
- Feasible strategy must consider the end use. This includes water quality, distance to end use, etc. For example, long transmission systems with pumping are not likely to be economically feasible for irrigation use.
- Strategy should provide a reasonable percentage of the projected need (except conservation, which will be evaluated for all needs).
- Strategy must meet existing federal and state regulations.
- Strategies must be based on proven technology.
- Strategy must be able to be implemented.
- Strategy must be appropriate for regional water planning.

5A-A.2 POTENTIAL FEASIBILITY BY WATER MANAGEMENT STRATEGY TYPE

In accordance with 31 TAC Chapter 357.34, the ETWPWG must evaluate all WMSs the regional water planning group determines to be potentially feasible. The types of WMSs evaluated and their potential feasibility within the ETWPWG are described below.

5A-A.2.1 Water Conservation.

The guidelines for regional water planning require that water conservation be considered as a strategy for every identified need. If water conservation is not adopted, the reason must be documented. Water conservation in the ETWPWG is driven more by economics than lack of readily available supply, and therefore, not every user will have the need to implement conservation. Additional screening criteria for conservation strategies were adopted to comply with this general policy. The criteria are outlined below.



- Municipal conservation strategies will be evaluated for all municipal WUGs. A new requirement from the 2026 RWP distinguishes water conservation into two separate categories: water use reduction and water loss mitigation. Water use reduction is recommended only for WUGs with baseline GPCDs above their associated thresholds based on their population group. On the other hand, water loss mitigation is recommended for all municipal WUGs, as it is considered a best management practice by the ETRWPG.
- The ETRWPG does not recommend water conservation for manufacturing WUGs. Although it is expected that manufacturers will implement water conservation measures during the planning period, the ETRWPG does not have the industry and site-specific information necessary to identify the current status of manufacturing water conservation or to recommend which measures should be implemented. In addition, changes to processes and equipment required for effective water conservation may be costly for manufacturing users, especially considering that water is readily available in the ETRWPA.
- The ETRWP does not recommend further water conservation beyond the irrigation conservation measures already implemented within the region. The ETRWPG encourages the implementation of irrigation water conservation measures; however, it does not have the farm-specific information necessary to identify the current status of on-farm water conservation or to recommend what measures should be implemented.
- Conservation will not be considered for steam electric power, livestock or mining water demands. The cost of water in these industries comprises a small percentage of the overall business cost, and it is not expected that these industries will see an economic benefit to water conservation.

5A-A.2.2 Drought Management Measures

Drought management WMSs are implemented in response to drought conditions. These strategies provide a safety factor for water users during drought. In the ETRPWP, drought management measures were not considered as strategies to meet long-range water supply needs.

5A-A.2.3 Wastewater Reuse

Reuse projects will be considered on a case-by-case basis. Both direct and indirect reuse will be considered based on current practices and other opportunities, as appropriate.

5A-A.2.4 Management of Existing Supplies

Use of existing supplies should be optimized, where possible, to meet new demands. Following is a discussion of how various types of existing supplies might be expanded and were considered as potentially feasible strategies for the ETRWA.

5A-A.2.4.1 Conjunctive Use of Groundwater and Surface Water

The conjunctive use of groundwater and surface water supplies may be considered when groundwater supplies are available. Applicable groundwater conservation district rules will be considered for such conjunctive systems.

5A-A.2.4.2 Acquisition of Available Existing Water Supplies

In general, supplies should be owned by a strategy sponsor or be available to that group for purchase;



however, the connection to existing supplies will be considered on a case-by-case basis. Acquisition of supplies may include purchasing existing groundwater wells or the right to surface water that another entity already has the physical and legal means to access. The ETRWPG will consider acquisition of supplies when an entity in need of supplies is adjacent to an entity with a surplus of supplies and both entities have shown an interest in the proposed acquisition.

5A-A.2.4.3 Regional Water Supply Facilities

Development of regional water supply facilities will be considered by the ETRWPG on a case-by-case basis. One or more regional sponsors will be required to manage this facility, and it will need to have consensus from involved parties.

5A-A.2.4.4 Voluntary Water Transfer

This strategy type would include, but not be limited to, contracts, water marketing, regional water banks, sales, leases, options, subordination agreements, and financing agreements. Voluntary redistribution with the involved parties will be considered and the ETRWPG will come to a consensus on an approach. If the involved parties are not interested, this option will not be pursued. Voluntary subordination of existing water rights will be considered if the involved parties are amenable to the strategy. Alternatively, the ETRWPG may recommend that the water right holder consider selling water under their water right to the willing buyer.

5A-A.2.4.5 Emergency Transfers

Emergency Transfers of water will be considered in accordance with Texas Administrative Code §11.139 for temporary, interim supplies. Existing and potential emergency interconnects available to water users in the ETRWP is documented in Chapter 7.

5A-A.2.4.6 Interbasin Transfers

The ETRWPG will recommend interbasin transfers when necessary to transport water from the source to its destination. Interbasin transfers will be evaluated in accordance with current regulations.

5A-A.2.4.7 System Operation/Optimization

New or additional system operations may be considered if they are feasible and the owner wishes to adopt such strategies. Existing operating policies will be considered during evaluation of available supplies.

5A-A.2.4.8 Reallocation of Reservoir Storage

Reallocation of reservoir storage will be considered if the owner is amenable to reallocation and, where reallocation in federal reservoirs is being considered (such as from flood to conservation storage), an appropriate and willing local sponsor can be found to sponsor a federal study.

5A-A.2.4.9 Yield Enhancement

ETRWPG will consider yield enhancement projects, as appropriate, for the water source and identified need. Projects such as dredging and application for additional water rights, where permissible, will be considered.



5A-A.2.4.10 Area-Capacity Relationships

The connection of existing supplies will be considered on a case-by-case basis. In general, supplies should be owned by the water group with a need for additional supply or available to that group for purchase or permitting.

5A-A.2.4.11 Water Quality Improvement

Water quality improvement projects will be considered for municipal supplies that bring the existing water supply into compliance with state and federal regulations. General water quality projects may be considered if they improve the usability of the water source to help meet demands.

5A-A.2.5 New Supply Development

The development of new water supplies may be necessary to meet new water demands. A discussion of the development of new water supplies follows.

5A-A.2.5.1 Surface Water Resources

New surface water resources that can be permitted will be considered, provided a reasonable amount of supply to meet the identified need is located within a reasonable distance of the end users, and recommended new sources would be expected to provide water supplies at a reasonable cost.

5A-A.2.5.2 Groundwater Resources

The ETRWPG will consider groundwater supplies in areas where additional groundwater supply is available and can be produced at a sustainable level long-term. Regulation of the development of additional groundwater supply may be subject to the local Groundwater Conservation District (GCD) and/or Groundwater Management Area (GMA).

5A-A.2.5.3 Brush Control

Brush control is not considered a cost-effective water supply strategy in the ETRWPA due to the large amount of rainfall and lack of invasive brush species, and will not be considered a WMS.

5A-A.2.5.4 Precipitation Enhancement

The ETRWPA has an abundance of precipitation. Precipitation enhancement will not be considered as a WMS.

5A-A.2.5.5 Rainwater Harvesting

Rainwater harvesting can be applied as a best management practice on an individual, local basis by users across the ETRWPA to take advantage of the plentiful rain in the region. However, it will not be considered as a WMS.

5A-A.2.5.6 Seawater or Brackish Groundwater Desalination Facilities

A strategy of this type would be large-scale and would serve local or regional brackish groundwater zones identified and designated under Texas Water Code §16.060(b)(5). The ETRWPG will consider desalination on a case-by-case basis.

5A-A.2.5.7 Marine Seawater Desalination

A strategy of this type would be large-scale and would service local or regional entities. The ETRWPG will

Appendix 5A-A Screening Criteria for Potentially Feasible Water Management Strategies



consider desalination on a case-by-case basis.

5A-A.2.5.8 Water Right Cancellation

The ETRWPG will generally not pursue water right cancellation as a means of obtaining additional water supplies. Instead, the ETRWPG will recommend that the water right holder consider selling water under their water right to the willing buyer.

5A-A.2.5.9 Aquifer Storage and Recovery

Aquifer storage and recovery (ASR) will be considered where the structure of the aquifer is such that this method is applicable. An ASR study must have already been performed to consider an area feasible for an ASR project. The ETRWPG will consider ASR on a case-by-case basis.

Appendix 5A-B

Potentially Feasible Water Management Strategies

This appendix includes a table (Table 5A-B.1) summarizing identified water management strategies (WMSs) that were considered by the East Texas Regional Water Planning Group (ETRWPG) as potentially feasible for meeting Water User Groups (WUGs) with needs in the East Texas Regional Water Planning Area (ETRWPA) per 31 TAC §357.12(b). This includes consideration of the water management strategy types required by statute and rules (TWC §16.053(e)(5), and 31 TAC §357.34(c)).

Additionally, a list of the potentially feasible WMSs and water management strategy projects (WMSPs) considered by the ETRPWG is included in Table 5A-B.2. This includes potentially feasible WMSs/WMSPs identified for entities with needs, as well as other potentially feasible WMSs/WMSPs considered by the ETRWPG based on feedback from sponsors in the ETRWPA.



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Table 5A-B.1. Potentially Feasible Water Management Strategies Identified fo WUGs with Needs

Every WUG Entity with an Identified Need			WMSs to be considered by statute ¹													Additional WMSs to be considered by rule							
Water User Group Name	County	Maximum Need 2030-2080 (ac/yr)	Conservation - Water Use Reduction	Conservation - Water Loss Mitigation	Drought Management	Reuse	Management of Existing Supplies	Development of Large-Scale Marine Seawater or Brackish Groundwater	Conjunctive Use	Acquisition of Available Existing Supplies	Development of New Supplies	Development of Regional Water Supply or Regional Management of Water Supply Facilities	Voluntary Transfer of Water (Including Regional Water Banks, Sales, Leases, Options, Subordination)	Emergency Transfer of Water Under Section 11.139	Storage to New uses, Contracts, Water Marketing, Enhancement of Yield, Improvement of Water	New Surface Water Supply	New Groundwater Supply	Brush Management; Precipitation Enhancement	Interbasin Transfers of Surface Water	Aquifer Storage and Recovery	Cancellation of Water Rights	Rainwater Harvesting	Other
Steam Electric Power	Anderson	2,296	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing	Angelina	3,055	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mining	Angelina	533	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alto Rural WSC	Cherokee	665	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Athens	Henderson	2,701	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chandler	Henderson	934	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edom WSC ²	Henderson, Van Zandt	87	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livestock	Henderson	490	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mining	Henderson	143	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steam Electric Power	Henderson	2,061	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TDCJ Eastham Unit	Houston	113	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livestock	Houston	285	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing	Jasper	11,943	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beaumont	Jefferson	9,768	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trinity Bay Conservation District ²	Jefferson, Chambers	207	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing	Jefferson	175,165	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D&M WSC	Nacogdoches	218	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jacobs WSC	Rusk	58	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livestock	Sabine	96	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing	Shelby	1,325	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liberty Utilities Silverleaf Water ²	Smith, Wood	524	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Southern Utilities	Smith, Cherokee, Rusk	401	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
County-Other	Smith	273	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing	Smith	567	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mining	Smith	421	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	Trinity	215	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing	Tyler	102	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹ Texas Water Code §16.053(e)(5)

² These WUGs are primarily located in other regions (Regions C, D, or H). The needs shown reflect the total identified need across all regions, including Region I. The WMSs identified for these WUGs are discussed in their respective primary



Table 5A-B.2. List of Potentially Feasible Water Management Strategies Considered by the ETRWPG

Sponsor(s)	Water Management Strategy/Project
Multiple Entities	Municipal Conservation (Water Use Reduction)
Multiple Entities	Municipal Conservation (Water Loss Mitigation)
Multiple Entities	Irrigation Conservation
Multiple Entities	Manufacturing Conservation
Anderson County Steam Electric Power	New Wells in Carrizo-Wilcox Aquifer
B C Y WSC	New Wells in Carrizo-Wilcox Aquifer
Angelina County Mining	Purchase from Provider (Voluntary Transfer)
Angelina County Manufacturing	Purchase from Provider (Voluntary Transfer)
Alto Rural WSC	New Wells in Carrizo-Wilcox Aquifer
Athens	Purchase from Provider (Voluntary Transfer)
Edom WSC	New Wells in Carrizo-Wilcox Aquifer
Chandler	New Wells in Carrizo-Wilcox Aquifer
Chandler	Purchase from Provider (Voluntary Transfer)
Henderson County Livestock	Reuse from Lake Athens (Voluntary Transfer from Athens MWA)
Henderson County Mining	New Wells in Yegua-Jackson Aquifer
Henderson County Steam Electric Power	New Wells in Carrizo-Wilcox Aquifer
TDCJ Eastham Unit	New Wells in Carrizo-Wilcox Aquifer
Houston County Livestock	New Wells in Carrizo-Wilcox Aquifer
South Jasper County WSC	New Wells in Gulf Coast Aquifer
Jasper County Manufacturing	Purchase from Provider (Voluntary Transfer)
China	New Wells in Gulf Coast Aquifer
Trinity Bay Conservation District	Purchase from Provider (Voluntary Transfer)
Jefferson County Manufacturing	Purchase from Provider (Voluntary Transfer)
D & M WSC	New Wells in Carrizo-Wilcox Aquifer
Nacogdoches County-Other	Lake Naconiche Regional Water Supply System
Orange County WCID 1	New Wells in Gulf Coast Aquifer
Gaston WSC	New Wells in Carrizo-Wilcox Aquifer
Jacobs WSC	New Wells in Carrizo-Wilcox Aquifer
Sabine County Livestock	New Wells in Yegua-Jackson Aquifer
Shelby County Manufacturing	Purchase from Provider (Voluntary Transfer)
Liberty Utilities Silverleaf Water	(To be determined upon the Completion of the Region D 2026 IPP)



Table 5A-B.2. List of Potentially Feasible Water Management Strategies Considered by the ETRWPG

Sponsor(s)	Water Management Strategy/Project
Southern Utilities	Purchase from Provider (Voluntary Transfer)
Smith County-Other	Purchase from Provider (Voluntary Transfer)
Smith County Manufacturing	Purchase from Provider (Voluntary Transfer)
Smith County Mining	Purchase from Provider (Voluntary Transfer)
Trinity County Irrigation	Purchase from Provider (Voluntary Transfer)
Tyler County Manufacturing	New Wells in Gulf Coast Aquifer
Angelina Neches River Authority	Lake Columbia
Angelina Neches River Authority	Treatment and Distribution System
Angelina Nacogdoches WCID #1	Hydraulic Dredging
Athens Municipal Water Authority	Reuse of Fish Hatchery Return Flows
Athens Municipal Water Authority	Water Treatment Plant Booster Pump Station Expansion
Athens Municipal Water Authority	New Wells in Carrizo-Wilcox Aquifer
Beaumont	Amendment to Supplementary Contract with LNVA (Voluntary Transfer)
Beaumont	Well Field Infrastructure Improvements
Beaumont	Bunn's Canal Rehabilitation
Beaumont	New Westside Surface Water Treatment Plant
Center	Reuse Pipeline to Industrial Customers
Center	Pipeline from Toledo Bend Reservoir (Voluntary Transfer)
Houston County WCID #1	New Wells in Carrizo-Wilcox Aquifer
Jacksonville	Supply from Lake Columbia
Lower Neches Valley Authority	Devers Pump Station Relocation
Lower Neches Valley Authority	Neches Pump Station Upgrades and Fuel Diversification
Lower Neches Valley Authority	West Beaumont Reservoir
Lower Neches Valley Authority	Neches-Trinity Basin Interconnect
Lower Neches Valley Authority	Purchase from SRA (Toledo Bend)
Lufkin	Transfer from Sam Rayburn to Lake Kurth (Phase I - Phase III)
Nacogdoches	Supply from Lake Columbia
Tyler	Lake Palestine Infrastructure Expansion
Upper Neches River Municipal Water Authority	Neches Run-of-River with Lake Palestine