

To: Plateau Region Water Planning Group
From: Carollo Engineers, Inc., - Planning Group Consultant
Subject: Request to Obtain a Notice-to-Proceed on Task 5B
Date: April 25, 2024
Project: Scope of Work and Budget Allocation for Task 5B Water Management Strategy Analysis

The Texas Water Development Board (TWDB) has prepared a scope of work for development of the 2026 Plateau Water Plan (2026 Plan)¹. This scope of work identifies elements required to evaluate and recommend water management strategies and projects to meet the needs of water user groups (WUGs) and wholesale water providers (WWPs) across the state, as defined in Task 5B. The TWDB has quantified the total funds available for Task 5B, Evaluation and Recommendation of Water Management Strategies and Projects, but requires that each regional planning group submit a detailed scope of work identifying the water management strategies each planning group will evaluate as potentially feasible to meet identified needs within the planning area. All funds for this task are contingent upon written notice-to-proceed. The total budget in the executed contract for the Task 5B effort is \$145,222.00.

This scope of work includes evaluation of those strategies that have been identified by the Plateau Water Planning Group (Region J) as potentially feasible to meet the needs of WUGs and WWPs in the Region J planning area in the 2026 Plan. The potentially feasible strategies include all water management strategies (WMSs) evaluated in previous Plans, regardless of whether they were recommended. We anticipate evaluations of those WMSs that were not recommended (or alternative) to be relatively brief compared to those that were previously evaluated but will revisit associated assumptions to verify they remain valid.

Strategies included in this proposed scope of work for Task 5B have been organized consistent with those 24 types of WMSs required by statute and rules (TWC §16.053(e)(5), and 31 TAC §357.34(c)), and presented in Section 2.5.1 in *Exhibit C: Second Amended – General Guidelines for Development of the 2026 Regional Water Plans*, dated September 2023². Further, the strategies will be evaluated following the guidelines presented in the same document.

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 October 26, 2023 and gave final approval to the process and its inclusion in the Technical Memorandum on April 25, 2024.

The Plateau Region Water Planning Group, following an opportunity for public input, approved this Task 5B Scope and Budget for submittal to the TWDB at a public planning group meeting in Kerrville, Texas on April 25, 2024.

¹https://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2026/projectdocs/SecondAmendedSOW_2026RWPs.pdf?d=64314.5

² https://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2026/projectdocs/2026RWP_ExhibitC.pdf?d=64314.5

This document contains the following Attachments:

- Attachment 1 TWDB Exhibit C Second Amended Guidelines – 2.5.2 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 5B) Funds

Strategies to be included in the 2026 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 2021 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 2026 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.
8. Strategies that consider if the potential sponsor(s) have taken, or have indicated that they will take, affirmative steps towards the strategy's implementation. Affirmative steps may include, but not be limited to:
 - a) Spending money on the strategy or project;
 - b) Voting to spend money on the strategy or project;
 - c) Applying for a federal or state permit for the strategy or project

Task 5B involves the technical evaluation and selection of recommended and alternative water management strategies (WMSs) and water management strategy projects (WMSPs) to meet projected needs. Technical evaluations of WMSs and WMSPs in the 2026 Plan will be at the same level of detail and follow a similar pattern to evaluations completed in previous plans; any updated requirements will be addressed, as well.

A total of 93 potentially feasible strategies are grouped into 14 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 – Public Conservation Awareness
- Conservation – Water Loss Audit and Main Line Repair
- Conservation – Livestock
- Conservation - Irrigation Scheduling
- Conservation - Vegetative Management
- Drought Management
- Rainwater Harvesting
- Reuse
- Groundwater Development
- Surface Water Development
- ASR
- Infrastructure Development
- Eastern Kerr County Regional Water Supply Project
- Other Strategies

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

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.

Scope of Work

- Identify existing conservation efforts and potential for increased public awareness of benefits of conservation measures through public education.

Entities Potentially Receiving Water from Public Conservation Programs WMSs:

8 Municipal and County Other WUGs

Total Task Budget: \$4,256

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 within the previous 5-years utilizing the TWDB water-loss assessment surveys. 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:

10 Municipal and County Other WUGs

Total Task Budget: \$3,000

Conservation – Livestock

Rotational grazing consists of subdividing grazing pastures and rotating livestock from one pasture to another on a regular interval. This allows the watershed, soils, and vegetation to recover from the stress of continuous livestock grazing. A study by Texas A&M AgriLife Research at Vernon (Ledbetter, 2017) found that changing to a multi-pasture rotational livestock management system reduced surface runoff and sediment load in the local stream by 39 and 34 percent, respectively. The study also found that subsurface flow increased by 48 percent, primarily due to increased infiltration and soil water storage associated with rotational grazing.

Scope of Work

- Identify areas that benefit from rotational grazing which will allow the watershed, soils, and vegetation to recover from the stress of continuous livestock grazing.

Entities Potentially Receiving Water from Livestock Conservation Management WMSs:

6 County Other WUGs

Total Task Budget: \$1,800

Conservation – Irrigation Scheduling

This strategy is intended for producers with an adequate supply of water throughout the growing season. It involves scheduling the time and amount of water that is applied to a crop based on the amount of water present in the crop root zone, the amount of water consumed by the crop since the last irrigation, and other considerations.

Scope of Work

- Estimate potential water savings using the TWDB Best Management Practices.

Entities Potentially Receiving Water from Irrigation Scheduling WMSs:

1 County Other WUG

Total Task Budget: \$1,000

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 7th and 18th recommended conservation practice strategies in the TWDB Special Report – Water Conservation Implementation Task Force Report to the 79th 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:

7 County Other WUGs

Total Task Budget: \$1,788

Drought Management

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.

Scope of Work

- Identify entities with drought management authority and evaluate effectiveness of their programs.

Entities with Drought Management Authority WMSs:

1 Groundwater District WUG

Total Task Budget: \$950

Rainwater Harvesting

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 landowners to consider rainwater harvesting on their own properties, which will likewise reduce pumping impacts on the local Trinity Aquifer.

Scope of Work

- 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 Rainwater Harvesting WMSs:

1 Municipal WUG

Total Task Budget: \$950

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 Wastewater Reuse WMSs:

3 Municipal WUGs

Total Task Budget: \$4,215

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.

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

24 Municipal, County Other, Irrigation and Mining WUGs

Entities Potentially Receiving Water from Constructing Desalination Facilities WMSs:

1 County Other WUG

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

2 Municipal, County Other WUGs

Total Task Budget: \$21,782

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:

9 Municipal and County Other WUGs

Total Task Budget: \$13,190

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 and the City of Bandera, within the Region are the only municipalities currently using and/or considering ASR as a viable option. This group of strategies looks at the potential to increase the ASR capacity and to consider an ASR option for the proposed Eastern Kerr County Regional Project and for the City of Bandera.

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:

3 Municipal and County Other WUGs

Total Task Budget: \$5,807

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:

2 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: \$9,200

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

- Project 1: Construction of an Ellenburger Aquifer water supply source
- Project 2: Construction of an off-channel surface water storage
- Project 2: Construction of a surface water treatment facility and main distribution lines
- Project 3: Construction of an ASR facility
- Project 4: Construction of a Trinity Aquifer wellfield for dense, rural areas
- Project 4: Construction of a brackish groundwater desalination facility

Entities Potentially Receiving Water from the EKCRWSP WMSs:

11 County Other Communities

Total Task Budget: \$29,047

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 2026 Plateau Region Water Plan as more information becomes available.

Total Task Budget: \$11,618

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 2027 State Water Plan. Also, specific reports must be included in the 2026 Plateau Region Water Plan. The effort to enter this data and coordinate with the TWDB has historically taken considerable effort. 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 2026 Plateau Region Water Plan.

Entities

All WUGs and WWPs receiving water from a WMS.

Total Task Budget: \$11,619

Report Preparation and Coordination

Chapter 5 of the 2026 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 2026 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: \$25,000

Fee Summary

TASK NUMBER	TASK DESCRIPTION	BUDGET
1	Conservation Initiatives – Public Conservation Awareness	\$4,256
2	Conservation – Water Loss Audit and Main Line Repair	\$3,000
3	Conservation - Livestock	\$1,800
4	Conservation – Irrigation Scheduling	\$1,000
5	Conservation - Vegetative Management	\$1,788
6	Drought Management	\$950
7	Rainwater Harvesting	\$950
8	Reuse	\$4,215
9	Groundwater Development	\$21,782
10	Surface Water Development	\$13,190
11	ASR	\$5,807
12	Infrastructure Development	\$9,200
13	Eastern Kerr County Regional Water Supply Project	\$29,047
14	Other Strategies	\$11,618
15	Database Entry	\$11,619
16	Report Preparation	\$25,000
	Total	\$145,222

Attachment 1

TWDB Exhibit C Second Amended Guidelines
2.5.2 Water Management Strategy Evaluation

high-level, qualitative assessment and should not require modeling or other additional technical analyses.

2.5.2 Water management strategy evaluations

All potentially feasible WMSs and WMSPs identified for the region must be evaluated in accordance with 31 TAC §357.34 and meet the requirements in this document. This includes a quantitative reporting for each WMS of the net quantity, reliability, cost, and impacts on environmental factors and agricultural resources.

This information must 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 identification of potentially feasible WMSs considered for the region.

As necessary, RWPGs must update or redevelop any previous WMS or WMSP evaluations (e.g., developed as part of previous RWPs) to address the following:

- 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
- Accommodate changes in identified water needs
- Any other relevant changes that require modifying or replacing a WMS

For all WMSs and WMSPs previously identified in the 2021 RWPs and being considered for inclusion in the 2026 RWPs, RWPGs must 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 must determine the degree to which conditions have changed or new information has become available and update the WMS and WMSP evaluations accordingly.

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

Water management strategy technical evaluations and cost estimate summaries should identify the major facilities or projects related to the strategy, their approximate locations, and their associated capital costs. Project phases, if applicable, should be described and associated volumes and costs presented for each phase.

All recommended WMSs and WMSPs that are entered into DB27 must 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. WMSs that would not produce a measurable

firm yield supply in at least one planning decade may not be a recommended WMS and may not be eligible for funding from the State Water Implementation Fund for Texas (SWIFT).²⁸

Any other RWPG recommendations regarding permit modifications, operational changes, and/or other infrastructure that do not provide a firm yield during drought of record conditions must be indicated as such and presented separately in the RWP.

WMS and WMSP data presented in the IPP and final adopted RWP must be structured in a way that is compatible with DB27 as outlined in the TWDB's Contract Exhibit D: *Guidelines for 2026 Regional Water Plan Data Deliverables*. To facilitate public comprehension of the adopted RWPs and the interactive state water plan, the naming conventions for WMSs/WMSPs used in DB27 should also be used in the IPP and final adopted RWP.

Water quantities produced by recommended WMSs and WMSPs must be based on water availability in accordance with Section 2.3. Additionally, WMSs shown as providing a supply in a planning decade, must come online, with a reliable supply, *in or prior to that initial decade year* (31 TAC §357.10(21)). If a WMS is shown as providing supply in the 2040 decade, it must be assumed to come online in or prior to the year 2040.

2.5.2.1 Surface water water management strategies

When evaluating WMSs to determine future water availability associated with surface water to meet identified water needs, RWPGs must adhere to the following requirements:

1. Analyses must be based on firm yield and firm diversion.
2. RWPGs must analyze every WMS using an unmodified TCEQ WAM Run 3 to determine surface water availability and WMS firm yield firm diversion. This analysis reflects conditions under which an associated permit application will be evaluated. Modifications to TCEQ WAM RUN 3 for WMS evaluations require the submittal of a hydrologic variance request and written approval by the TWDB Executive Administrator, as outlined in Section 2.3.5.
3. When the WMS being evaluated (as well as the anticipated permitting process associated with the WMS) is contingent upon a future new water right (including for a new reservoir); a future amendment of an existing water right; a proposed subordination agreement; and/or a proposed new use of return flows, the TCEQ WAM Run 3 may be modified only to the degree required to allow the simulation of such a WMS²⁹. The resulting modified WAM, however, may not then be used as the basis for evaluating other additional WMSs unless they are anticipated to be implemented in combination.
4. Analyses must be in accordance with environmental flow standards adopted in TCEQ's 30 TAC Chapter 298 rules or, if there are no TCEQ environmental flow standards, other relevant limitations (e.g., pass-throughs required by the [1997 Consensus Criteria for Environmental Flow Needs](#)). Note that TCEQ has not added the Chapter 298 environmental flow standards to all WAMs for basins with adopted standards. In some basins, the RWPG may have to add the relevant Chapter 298

²⁸ 31 TAC §357.34(d)

²⁹ Any such modifications are subject to written approval from the Executive Administrator, as outlined in Section 3.6

environmental flow standards to the WAM to evaluate a WMS. The RWPG must document what steps were taken to account for environmental flows.

5. RWPs must clearly indicate which, if any, WMSs are assumed to rely on or to mutually exclude another WMS(s) and explain how the interaction may impact both the estimated future water availability and the future water supply associated with each WMS.
6. Consideration that water needs resulting from non-firm run of river supplies resulting from intra-year shortages might be met in some cases, for example, by a recommended WMS that adds an amount of off-channel storage sufficient to increase the firm diversion amount (i.e., to “firm up” the associated water supply in all months and in all years).
7. Conjunctive WMSs (i.e., using a combination of surface water, groundwater, and/or reuse) must have an overall firm supply as a WMS project but may be associated with less than firm surface water volumes during certain periods as long as the groundwater availability (or reuse availability) offsets the surface water availability sufficiently to ensure a firm WMS project yield.
8. A portion of a reservoir’s firm yield that is unpermitted, if any, may not be shown as a currently accessible existing water supply from that source. However, RWPGs may evaluate and include a WMS to amend the reservoir’s permit to authorize use of the additional firm yield to create new supply.
9. If there are factors that could potentially limit the firm yield/firm diversion of a WMS that are not reflected in the applicable TCEQ WAM RUN3 and that the RWPG considers significant to a recommended WMS, RWPGs may consider validating the WMS firm yield through the underlying WAM(s) that was used to evaluate existing surface water availability as referenced in Section 2.3.1. This does not include applying the same assumptions to the WMS being validated (e.g., safe yield procedures used to evaluate existing availability would not have to be applied to a WMS’s new reservoir(s)). This analysis may be performed to confirm that a WMS being recommended could be reasonably expected to provide the estimated supply under the same drought conditions on which existing water supplies were evaluated. If considered appropriate by the RWPG, this validation could be the basis for reducing an estimated WMS firm yield but may not be used as the basis for increasing a WMS firm yield above that determined using an unmodified TCEQ WAM RUN3. This validation, if applied, is intended to provide a conservative measure to ensure that future WMS supplies are not over-estimated for drought planning purposes.
10. As described in Section 2.3.2, potential future operation of multiple reservoirs as a new system, or changes to current operational procedures for existing reservoir systems, for the purpose of providing additional yield may be evaluated as a potential WMS. Such a WMS analysis must adequately describe methods used to calculate these future system gains (to be permitted) and include discussion regarding any associated permit changes that would be required.

2.5.2.2 Groundwater water management strategies

Groundwater WMS supply volumes, including those for desalinization WMSs, must be within the availability of the associated groundwater volumes available in the project location.

For planning purposes, future groundwater availability cannot be increased by implementing water management strategies other than aquifer recharge-type projects. Groundwater availability may increase or decrease in the future, typically through changes in groundwater management policy (revised DFCs) or improvements in technical evaluation approaches (new or updated groundwater availability models). Groundwater availability may also increase with the identification of brackish groundwater production zones not previously accounted for in a MAG.

When evaluating WMSs associated with groundwater to meet identified water needs, a future groundwater WMS would utilize that portion of an aquifer's groundwater availability that would require new or additional infrastructure and/or new permits in order to withdraw that water.

RWPGs must consider opportunities for, and the benefits of, developing WMSs for large-scale brackish groundwater desalination facilities that could utilize local or regional brackish groundwater production zones, where brackish groundwater is defined for regional water planning purposes as a total dissolved solid (TDS) concentration typically between 1,000 and 10,000 milligrams per liter (mg/L).³⁰

TWDB's website³¹ includes information on designated brackish groundwater production zones (BGPZ), including shapefiles, maps, data, and reports. These resources are available to planning groups to assist in their consideration of developing brackish supplies.

For BGPZs that overlap a MAG, the groundwater source record in DB27 will be labeled to note this. For BGPZs that do not overlap a MAG, a new source request would need to be approved by TWDB in order to utilize the BGPZ for a WMS. Such source request would need to include, at minimum, the latitude and longitude of the proposed WMS, the BGPZ, the aquifer formation, the proposed brackish availability for the WMS, and the methodology used to determine local availability.

Overallocation of annual groundwater availability is strictly prohibited. TWDB will review IPPs and final adopted RWPs to ensure that annual groundwater availability is not exceeded or "overdrafted" during any decade or for any discrete geographic-aquifer unit by existing supplies and/or future WMS supplies. WMSs that would require temporarily pumping groundwater in excess of a MAG may not be included in an RWP, unless a written hydrologic variance request for a MAG Peak Factor that would accommodate temporary increases in existing annual availability for planning purposes is approved in writing by the EA. See Section 2.3.5.2 for more information on the hydrologic variance process. Additionally, in instances where more than a single WUG and/or WWP seek to include recommended groundwater based WMSs that, when combined, would exceed the annual

³⁰ Related to 84(R), HB 30 requirements.

³¹ <https://www.twdb.texas.gov/groundwater/bracs/HB30.asp>

groundwater availability the affected RWPG(s) may not include these recommended WMSs simultaneously in the RWP(s).³²

2.5.2.3 Reuse water management strategies

This same population-dependent concept described for reuse availability and supplies in Section 2.3.3 would hold true for determining future WMS decadal reuse availabilities and can include new capacity from additional strategy WWTP infrastructure.

RWPGs must evaluate potential future sources of direct and/or indirect reuse that will require new permits and additional reclamation infrastructure as WMSs and must provide adequate justification to explain methods for estimating the amount of future direct and/or indirect reuse water available from such sources, including consideration of the population/demand projections for each decade associated with the WMS.

Just as for existing reuse, future reuse availability may not exceed the capacity of the future infrastructure to provide wastewater effluent for potential use. To avoid overestimating availability, the future reuse volume will also be dependent upon the WMSP online decade population/demand projections that would determine the amount of anticipated wastewater flowing into a WWTP on an annual basis. This population-dependent availability would be less than a future WWTP's maximum permit capacity and would increase each future decade (as population/demand projections increase) up to the annual volume restricted by infrastructure and/or permit (i.e., WWTP inflow projections would be a more stringent restriction for reuse availability in early planning decades).

RWPGs must provide adequate justification to explain methods used to estimate the future indirect reuse availability and supply generated, including consideration of the population/demand projections for each decade associated with the WMS.

Direct reuse WMS infrastructure components that are eligible to be included in the RWPGs are further specified in Section 2.5.2.12.

2.5.2.4 Aquifer storage and recovery water management strategies

Strategy yields

ASR WMS evaluations must also report the expected percent of recovery for the ASR projects and must present that expected, lesser volume as the net water supply yield for the project. This may be presented as a range of recovery over time, if applicable. Some amount of mixing occurs between the injected water and the native water in all ASR projects and the recovery of injected water increases after each injection cycle as a buffer zone between the injected water and the native groundwater is developed. The number of cycles needed to create this buffer zone is dependent on the physical characteristics of the aquifer and the groundwater geochemistry. In general, recovery typically ranges from 70 to 90 percent for ASR systems, but this is site-specific parameters and can vary. The most ideal ASR projects are placed in confined aquifers composed of clean sandstone, which will usually allow for higher rates of recovery (greater than 90 percent). Projects may also be in

³² Applies both intra-regionally and inter-regionally. Competing project supply volumes may be prorated, for example.

other types of aquifers which are common in Texas. Carbonate aquifers, for example, generally contain fractures and cave features that may result in the loss of stored water. Recovery rates in carbonate aquifers are generally lower (70 percent).

ASR assessments for significant identified water needs

In accordance with HB807 86th Legislative Session, “*if a RWPA has significant identified water needs, [the RWP shall provide] a specific assessment of the potential for aquifer storage and recovery projects to meet those needs.*”

The threshold(s) for “significant” identified water needs are to be defined by the RWPG; and the RWPGs must articulate in their RWP how they determined the threshold of significant water needs for this requirement and which entities met this threshold.

If an RWPG determines that water needs are significant, the RWPG must assess ASR as an option for meeting those needs. This assessment may include consideration of the TWDB’s Statewide Survey of ASR and AR Suitability interactive web map³³. This tool may be used to assist in identifying a geographic area(s) relative suitability (most, moderately, and less suitable) for ASR project development. The final ASR suitability rating(s) are based on three screenings: hydrogeological characteristics, excess water, and water needs. The tool can also be used to examining these screenings independently³⁴.

Links to the TWDB’s available and relevant information on ASR for the RWPGs to consider in this effort is provided in Section 3.

2.5.2.5 Conservation water management strategies

Municipal conservation

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 or replacement.

When evaluating and recommending WMSs and WMSPs, each RWPG **must include** active water conservation measures for WUGs with identified needs to which TWC §11.1271³⁵ and TWC §13.146³⁶ apply. Water conservation measures are defined in 31 TAC §357.10(36) as practices, techniques, programs, and technologies that will protect water resources, reduce the consumption of water, reduce the loss or waste of water, or improve

³³ <https://twdb-wsc.maps.arcgis.com/apps/webappviewer/index.html?id=50d9b795672243d387cef438f7c62311>

³⁴ The hydrogeological parameters screening identifies the aquifer with the most suitable physical characteristics for an ASR project. The excess water screening identifies potential sources of water that can be used as an injectate. The water needs screening identifies geographic area(s) with a municipal, industrial, or steam electric need for water supply. The water needs screening is limited to data that is available with a definitive geographic location within the statewide survey’s grid. Additional needs may be able to be identified on a site-to-site basis.

³⁵ Relating to Additional Requirements: Water Conservation Plans: <https://statutes.capitol.texas.gov/Docs/WA/htm/WA.11.htm>

³⁶ Relating to Water Conservation Plans: <https://statutes.capitol.texas.gov/Docs/WA/htm/WA.13.htm>

the efficiency in the use of water that may be presented as Water Management Strategies, so that a water supply is made available for future or alternative uses.

For planning purposes, Water Conservation Measures do not include reservoirs, aquifer storage and recovery, or other types of projects that develop new water supplies. These measures must be consistent with the minimum requirements in TCEQ's administrative rules 30 TAC §288.2³⁷, including water use reduction and water loss mitigation. The measures may be included in the plan as a conservation WMS. TWDB will provide information for WUGs that submit conservation plans in accordance with these statutory requirements and TWDB administrative rules 31 TAC §363.15 (related to Required Water Conservation Plan) and their associated targets, goals, BMPs, and water loss information for RWPG use in developing water use reduction and water loss mitigation strategies for these WUGs.

Each RWPG must also

1. consider active water conservation measures for WUGs and WWP WUG customers with identified needs;
2. 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(i)(2)(D); and
3. separate conservation strategies and their projects into either a *Conservation – water loss mitigation* or *Conservation – water use reduction* WMS type³⁸.

If TWC §11.085(l) applies to a proposed IBT, the RWPG must

1. include a water conservation WMS that includes water conservation measures at the highest practicable level of water conservation and efficiency achievable³⁹ (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;⁴⁰ and
2. 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 DB27 generated standardized report for each WUG with an associated recommended WMS that requires an IBT.

Best Management Practices identified by the state's Water Conservation Advisory Council and other information for consideration, including the Statewide Water Conservation Quantification Project and the Municipal Water Conservation Planning Tool, may be found on the TWDB website⁴¹. Please note that planning data included in the Municipal Water

³⁷ Relating to Water Conservation Plans for Municipal Uses by Public Water Suppliers:

[https://texreg.sos.state.tx.us/public/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&p_g=1&p_tac=&ti=30&pt=1&ch=288&rl=2](https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&p_g=1&p_tac=&ti=30&pt=1&ch=288&rl=2)

³⁸ Additional guidance including examples of the conservation WMS types will be provided in TWDB's Contract Exhibit D: *Guidelines for 2026 Regional Water Plan Data Deliverables*

³⁹ 31 TAC §357.34(i)(2)(c)

⁴⁰ WMSs that require an IBT under TWC §11.085 should indicate this.

⁴¹ <http://www.twdb.texas.gov/conservation/index.asp>

Conservation Planning Tool is not currently up to date, however the tool may be used to determine savings from implementing certain water conservation strategies.

Agricultural conservation

Resources to assist with developing agricultural conservation WMSs are included in Section 3.1.4.

2.5.2.6 Drought management water management strategies

For regional water planning purposes, drought management strategies are temporary demand management measures that reduce water use during times of drought by restricting normal economic and domestic activities.

RWPGs must document the consideration of drought management measures for all WUGs with identified water needs and must identify and describe drought management measures for each WUG to which TWC §11.1272⁴² applies. Drought management measures are defined in 31 TAC §357.10(9) as demand management activities to be implemented during drought that may be evaluated and included as Water Management Strategies. The drought management measures must be consistent with the minimum requirements in TCEQ's administrative rules 30 TAC Chapter 288 Subchapter B⁴³, including targeted reductions. Drought management WMSs are not required to be recommended, however if the RWPG does not recommend drought management WMSs, the plan must provide documentation in accordance with Section 2.5.2.7. The TWDB will provide a list of entities that submit drought contingency plans in accordance with these statutory requirements for RWPG use in developing drought management measures or strategies for these WUGs.

Examples of how regions developed drought management strategies in past plans include

- reviewing drought triggers and responses in Drought Contingency Plans (DCP) and deferring to the DCP "severe" trigger response goal to estimate drought management water savings or recommending a demand reduction percentage based on a WUG's GPCD if a DCP is unavailable;
- reviewing drought triggers and responses in DCPs and considering individual DCP trigger types and the frequency a trigger might be reached along with a WUG's projected water demands to estimate drought management water savings;
- recommending a standard demand reduction percentage for all applicable WUGs and utilizing the TWDB Drought Management Costing Tool to estimate the associated annual water savings and cost; and
- recommending a percentage of demand reductions for specific wells based on drought management plan triggers.

⁴² Relating to Additional Requirement: Drought Contingency Plans for Certain Applicants and Water Right Holders: <https://statutes.capitol.texas.gov/Docs/WA/htm/WA.11.htm>

⁴³ Relating to Drought Contingency Plans: [https://texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=288&sch=B&rl=Y](https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=288&sch=B&rl=Y)

If, after considering drought management WMSs 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 must document the reason.

2.5.2.7 Documentation of implementation status and anticipated timeline for certain types of recommended WMSs

Chapter 5 of the IPP and final RWPs must include a **new** sub-section documenting the implementation status of certain WMSs that are recommended in the plan, as listed below.

Each RWP must include this new sub-section in the plan. If no applicable WMSs are recommended by the region, the region must include a statement documenting this within the sub-section.

The implementation status must be provided for the following types of recommended WMSs with any online decade⁴⁴:

- All reservoir strategies (including major and minor reservoirs)
- All seawater desalination strategies
- Direct potable reuse strategies that provide greater than 5,000 acre-feet per year (AFY) of supply in any planning decade
- Brackish groundwater strategies that provide greater than 10,000 AFY of supply in any planning decade
- Aquifer storage and recovery strategies that provide greater than 10,000 AFY in any decade
- All water transfers from out of state
- Any other innovative technology projects the RWPG considers appropriate

The subsection must be clearly labeled and include the following items:

1. A table documenting the status of key milestones such as when the sponsor took an affirmative vote or other action to make expenditures necessary to construct or file applications for permits, state water right, diversion, or discharge permit status, federal 404 permit status, planning, design, and construction status, and expenditures to date. A WMS status table template to collect this information is included in the [2026 RWP Exhibit C Tables Excel file](#). **Planning groups are required to utilize the template for this subsection.**
2. A simple, graphic, showing the full planning horizon, and displaying separate timeline/schedules for each project (per above list) that includes major anticipated/estimated, future implementation milestones (e.g., feasibility, design, permitting, acquisition) and construction milestones (e.g., anticipated start and completion dates) either graphically as timeframe periods (e.g., Gantt bars) or as single milestones representing estimated end-dates of key activities (e.g., issuance target date of 404 permit or water right), as well as those milestones already achieved.

⁴⁴ The list of WMS types is updated based on House Bill 1565, 88th Texas Legislature.

The sub-section must demonstrate the feasibility, based on key milestones achieved and anticipated timing of future milestones, of each recommended strategy to be fully implemented *by the online decade in the regional plan*.

Additional information regarding the anticipated implementation schedule of these projects may be included as an appendix to the plan.

2.5.2.8 Documentation of certain WMS that are not recommended by the RWPG

If the following types of WMSs are not recommended by the RWPG, the RWP must include documentation of why these WMSs were not recommended:

- Conservation WMSs for each WUG with an identified need
- Drought management WMSs for each identified water need
- Aquifer storage and recovery
- Brackish groundwater desalination
- Seawater desalination

The documentation of reasons may be included as shown in the Potentially Feasible WMS template of the 2026 RWP Exhibit C Tables Excel file or elsewhere in the plan document as deemed appropriate by the RWPG.

2.5.2.9 Water management strategy losses

Estimated water losses associated with each WMS must be presented in the IPP and final adopted RWP. Water losses may be presented as a calculated percent water loss included in each strategy evaluation or a range of estimated losses by strategy type.

Technical evaluations may present, for example

1. total intake volumes at the supply source;
2. total net volume delivered to the end water user(s) (e.g., WUG(s));
3. with the difference between (1) & (2) being total water loss (e.g., due to conveyance losses); or,
4. the associated calculated percent water losses for strategies.

2.5.2.10 Impacts and limitations on water management strategies

RWPGs must evaluate the effects of WMSs on the environment by providing a quantitative reporting of the following environmental factors:

1. Environmental water needs
2. Wildlife habitats
3. Cultural resources
4. The effects of upstream development on the bays, estuaries, and arms of the gulf of Mexico

WMS evaluations must also include the following:

- Quantitative reporting of impacts to agricultural resources
- Other factors as deemed relevant by the RWPG including recreational impacts

These evaluations may be in a variety of forms, including a cumulative analysis of all recommended WMSs in the plan. RWPGs must document an overall methodology for evaluating impacts. Illustrative examples of quantification from previous planning cycles have included

1. project-specific acreages impacted for agricultural resources and wildlife habitats;
2. quantified ranges of acreage correlating to qualitative impact descriptions (e.g. low, medium, high);
3. degree of impacts on the reduction or increase in instream flows or bays and estuaries;
4. flow frequency curve comparisons;
5. well hydrographs of anticipated pumping;
6. percent attainment of freshwater inflow targets (annual and monthly) under different scenarios; and,
7. monthly median freshwater inflows comparisons.

For environmental flows and incorporating appropriate limitations on WMS yields, RWPGs must, in the following order

1. follow environmental flows standards in TCEQ 30 TAC Chapter 298 rules⁴⁵; or, in the absence of these flow standards;
2. use site specific studies when available; or, in the absence of these studies; or,
3. apply the *1997 Consensus Criteria for Environmental Flow Needs*.⁴⁶

This will be done in order to evaluate WMSs involving surface water development requiring permits from the TCEQ, including limitations to firm yield associated with releases or pass-throughs based on these criteria.

Please note that TCEQ has not added the Chapter 298 environmental flow standards to all WAMs for basins with adopted standards. In some basins, the RWPG may have to add the relevant Chapter 298 environmental flow standards to the WAM to evaluate a WMS. The RWPG must document what steps were taken to account for environmental flows.

The 1997 Consensus Criteria were developed through extensive collaboration among scientists and engineers from the state's natural resource agencies including the TWDB, TCEQ, and the TPWD, as well as academic professionals, engineering consultants, and informed members of the public. More specifically, the criteria are multi-stage rules for environmentally safe operation of impoundments and diversions during above normal flow conditions, below normal flow conditions, and during drought of record conditions. Documentation describing the methodology and its application is available [online](#).

2.5.2.11 Recommended water management strategies requiring interbasin transfers

RWPGs recommending water management strategies involving an interbasin transfer must include documentation of consideration of the highest practicable level of water conservation and efficiency achievable, including water conservation strategies for each

⁴⁵ [http://texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=298&sch=A&rl=Y](http://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=298&sch=A&rl=Y)

⁴⁶ These consensus criteria can be found in Appendix 2.0 of this guidelines document.

WUG or WWP that is to obtain water from a proposed interbasin transfer to which TWC 11.085 applies (31 TAC §357.34(g)(2)(C).

For these strategies, RWPGs must determine, and report projected water use savings in gallons per capita per day based on its determination of the highest practicable level of water conservation and efficiency achievable. RWPGs must develop conservation strategies based on this determination. RWPGs must seek the input of WUGs and WWPs as to what is the highest practicable level of conservation and efficiency achievable, in their opinion, and take that input into consideration. When developing water conservation strategies, the RWPGs must consider potentially applicable best management practices. Strategy evaluation in accordance with this section must include a quantitative description of the quantity, cost, and reliability of the water estimated to be conserved under the highest practicable level of water conservation and efficiency achievable

The RWPG must also consider and discuss the provisions in TWC §11.085(k)(1) for Interbasin Transfers of Surface Water. At minimum, this consideration must include a summation of Water Needs in the basin of origin and in the receiving basin.

Recommended conservation WMS information will be tabulated in a DB27 generated standardized report for each WUG with an associated recommended WMS that requires an IBT.

2.5.2.12 Financial costs

Cost evaluations for WMSPs must include capital costs, debt service, and annual operating and maintenance expenses over the planning horizon. The TWDB provides a WMSP costing tool that is required to be used by RWPGs (see Section 2.5.2.13)⁴⁷. Reported costs should only include expenses associated with infrastructure needed to convey water from sources and treat water for end user requirements. Reported costs may not include expenses associated with internal distribution networks (e.g., infrastructure beyond treatment plants and major transmission/conveyance facilities). RWPGs must report capital costs and average annual operation and maintenance costs as separate items in DB27⁴⁸.

Costs of WMSPs must be prepared and presented separately and discretely for each separate WMSP and may not be aggregated and presented as a single capital cost representing multiple WMSPs that would actually be located in multiple locations and funded by separate sponsors or implemented separately. Each project with a capital cost should have an associated volume of water or annual capacity presented in the plan. RWPGs may not, in general, aggregate multiple facilities into a single cost estimate and then allocate shares of the resulting total cost, for example, pro rata across several entities or locations.

⁴⁷ The EA anticipates that this costing tool will either be updated fully for application assumptions and complete construction cost data; or if staff resources are limited, costs will be adjusted using the appropriate Engineering News Record (ENR) cost index.

⁴⁸ See the TWDB's Contract Exhibit D: *Guidelines for 2026 Regional Water Plan Data Deliverables* for further information.

Capital costs

Capital costs consist of construction funds and other capital outlays including, but not limited to, costs for engineering, contingencies, financial, legal, administration, environmental permitting and mitigation, land, and interest during construction.

Construction costs, if applicable, must be based on September 2023 price indices for commodities such as cement and steel as reported in the *Engineering News Record (ENR) Construction Cost Index*⁴⁹ and include expected construction bid prices for the following types of infrastructure:

1. Pump stations
2. Pipelines
3. Water intakes
4. Water treatment and storage facilities
5. Well fields
6. Relocation of existing infrastructure such as roads and utilities
7. Any other significant construction costs identified by each RWPG

Note that if construction cost estimates are available for some WMSPs based on prior cost estimates that are more detailed than those provided by the WMSP costing tool provided by the TWDB, these more detailed cost estimates may be updated by adjusting them based on the September 2023 price indices for commodities such as cement and steel as reported in the *ENR Construction Cost Index*.

Interest during construction is based on total project costs drawn down at a constant rate per month during a construction period. Interest is the total interest accrued at the end of a construction period using a 3.5 percent annual interest rate less a 0.5 percent rate of return on investment of unspent funds.

If applicable, other capital costs include⁵⁰

1. engineering and feasibility studies, legal assistance, financing, bond counsel, and contingencies (engineering, contingencies, financial, and legal services may be lumped together and estimated as 30 percent of total construction costs for pipeline projects and 35 percent for other facilities unless more detailed project and/or site-specific information is available);
2. permitting and mitigation activities including, but not limited to, those associated with
 - a. archeological/historic resources;
 - b. environmental analyses and biological assessments;
 - c. mitigation activities including: evaluation, land acquisition, implementation, monitoring, financial assurances, and adaptive management; or
 - d. other permitting and mitigation costs.
3. land purchase costs not associated with mitigation;

⁴⁹ ENR quarterly cost reports can be found at <http://www.enr.com>

⁵⁰ These development costs may vary by project category based on the TWDB WMSP costing tool.

4. easements costs (easement costs for pipelines must include a permanent easement plus a temporary construction easement as well as rights to enter easements for maintenance); and,
5. purchases of water rights.

Note that costs and land areas associated with development of reservoirs, in particular, must be broken out within the aforementioned costing items to show separate lines items for:

1. the land area of the reservoir footprint (conservation pool only) alongside the estimated land purchase cost;
2. mitigation land area and associated estimate of purchase cost; and,
3. construction costs of embankment/dam facilities (separate from transmission facilities).

Debt service

For WMSs other than reservoirs the length of debt service is 20 years unless otherwise justified. For reservoirs, the period is 40 years. Level debt service applies to all projects, and the annual interest rate for project financing is 3.5 percent. Terms of debt service must be reported in the evaluation of each project.

Annual operating and maintenance costs

Operations and maintenance unit costs must be based on the associated quantity of water supplied. Unless more accurate, project-specific data are accessible, RWPGs must calculate annual operating and maintenance costs as 1.0 percent of total estimated construction cost for pipelines, 2.5 percent of estimated construction costs for pump stations, and 1.5 percent of estimated construction costs for dams. Costs must include labor and materials required to maintain projects such as regular repair and/or replacement of equipment. Power costs must be calculated on an annual basis using calculated horsepower input and a power purchase cost of \$0.09 per kilowatt hour; however, each RWPG may adjust this figure based on local and regional conditions if they specify and document their reasons. RWPGs must include costs of water if WMSs involve purchases of raw or treated water on an annual basis (e.g. leases of water rights).

At a minimum, annual costs should be presented by debt service, operation and maintenance cost as a percentage of total construction cost, power costs, and cost of purchasing water (if applicable). If precise information on the cost of purchasing water is not available, the plan should include a best estimate (e.g., as a percent markup) or an estimated range of the raw or treated water cost and the water management strategy evaluation can state the average cost is an estimate.

Unit costs of water

The RWP must present the unit costs of the net volume of water anticipated to be delivered to water users (after water losses) in dollars per acre-foot. Unit costs of WMSs must be evaluated, compared, and presented in an 'apples-to-apples' manner. For example, RWPGs should not compare firm yield unit water costs of one reservoir to the safe yield unit water costs of another reservoir within the same river basin when comparing alternatives.

2.5.2.13 WMSP costing tool for regional water planning

The TWDB spreadsheet-based WMSP costing tool, or Uniform Costing Model, will be updated and made available for use by RWPGs and located, along with a user guide, on the TWDB website. This spreadsheet-based costing tool provides a broad set of historical costs linked to costing curves that will be utilized to develop costs for typical elements of water projects (e.g., pump stations, pipelines, and treatment plants). This tool reflects the requirements of these regional water planning guidelines and presents output cost data accordingly. The tool has the flexibility to incorporate a certain amount of local knowledge and project specific data.

In the absence of more accurate and detailed, project-specific cost estimates, RWPGs must utilize this WMSP costing tool for every cost estimate presented in the RWPs, including updating project cost estimates previously developed in the 2021 RWPs. RWPGs must include the costing tool's standardized, automated cost output report for each WMSP evaluated in the IPP and final adopted RWP. If a different format is utilized, the RWPG must apply the data and procedures used in the costing tool and present the resulting output as analogous to the costing tool, for example breaking out capital cost estimates for each project component.

2.5.2.14 Infrastructure/costs that must be included in regional water plans

The WMSP components that are included in RWPs will be limited to the infrastructure and costs that are required to develop and convey increased water supplies from water supply sources and/or to treat the water for the end-user entity. This may include treatment facilities at the end-user entity's delivery point or treatment facilities at a point prior to transmission to the WUG (e.g., at a WWP location). Costs will also include conservation WMSs that have associated infrastructure or other costs (e.g., to address water loss; plumbing retrofits); or WMSs needed to address infrastructure bottlenecks in an existing water supply conveyance system—the removal of which would allow an increase to the water supply volume delivered to an end-user entity.

The types of facilities and associated capital or other costs that may be included in a RWP⁵¹ are directly associated with development of new supplies from new water sources or additional supplies from more efficient use of existing supplies (i.e., conservation), or volumetric increases to existing water supplies delivered to entities. Such strategies include but are not limited to

1. facilities associated with a new water supply (e.g., new reservoir, new well field, intakes, pump stations);
2. water supply storage facilities associated with increasing water supply source yields (e.g., reservoirs, some aquifer storage and recovery facilities);
3. facilities that are required to increase water supply from an existing water supply source (e.g., a new water transmission pipeline from an existing reservoir);

⁵¹ RWPGs must report capital and annual costs through DB27. See the TWDB's Contract Exhibit D: *Guidelines for 2026 Regional Water Plan Data Deliverables* for further information.

4. expansion of existing facilities that are required to accommodate increased supply capacity to treat increased water supply for entities (e.g. water treatment plant capacity expansion);
5. facilities associated with increasing overall water supply yields, for example, by blending new sources of water with existing water sources (e.g., conjunctive use);
6. expanded infrastructure required to fully utilize existing water rights/supplies (e.g. expansion of an undersized raw water intake or expansion of a water treatment plant);
7. new facilities required to obtain water from an existing water source that may be changing (e.g., replacement of a groundwater well in order to obtain water from an existing groundwater supply in an aquifer that is being drawn down below the level of the existing well);
8. infrastructure associated with water (raw or treated) supply transmission lines from WWPs to WUGs;
9. costs associated with conservation WMSs that have identified capital or other costs for the associated decrease in system water use or water losses, including active plumbing retrofit programs; replacement of portions of an existing leaking water transmission or distribution network that results in an immediate, quantifiable increase in water supply; or, meter replacement/SCADA installation that also results in an immediate, quantifiable increase in water savings;
10. costs associated with the increased wastewater/water treatment requirements that are required to meet standards for providing new or additional reuse water supplies; and
11. costs associated with major conveyance lines delivering reuse water from treatment plants to a different WUG delivery points (i.e. industrial facilities).
12. costs of temporary drought management strategies.⁵²

Water plans may include only infrastructure costs that are

1. associated with volumetric increases of treated water supplies delivered to WUGs (e.g., up to a water utility's intake or service area), or
2. that would immediately result in more efficient use of existing supplies or in an immediate reduction in water losses.

In accordance with 31 TAC §357.34(e)(3)(A), regional and state water plans may not include the cost of distribution of water within a WUG service area.⁵³ The only exception regarding the inclusion of costs associated with water distribution systems are for direct reuse projects and conservation strategy projects that are in accordance with the following guidance.

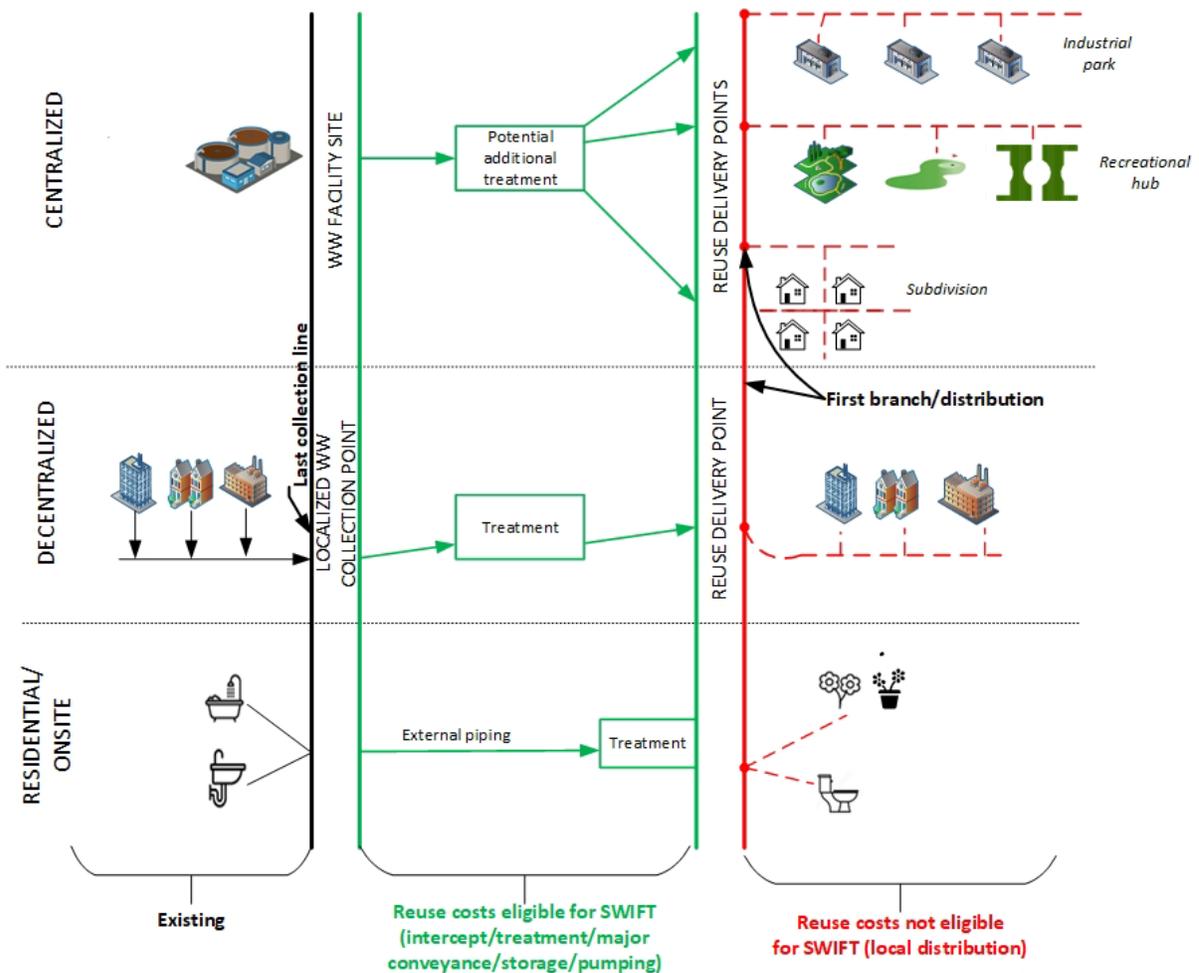
⁵² Estimated costs of probable economic impacts due to temporary drought management strategy implementation may be presented for WMS evaluation and comparison purposes within technical analyses but may not be included in water plans as a capital cost of the RWP. The TWDB WMSP costing tool includes a temporary drought management strategy component that may be used to estimate economic impacts associated with demand reductions for the purpose of comparing to costs of WMSs.

⁵³ The reference of distribution system in the section is not equivalent to large-scale transmission projects within the boundaries of collective reporting units.

Direct reuse (see Figure 2)

1. Costs associated with major conveyance lines delivering reuse water from treatment plant to/within a WUG's distribution system or subdivision *but prior to submains or branching lines*.
2. Cost of major conveyance line delivering direct reuse supplies to/within a WUG's service area and only **up to** a delivery 'hub' location, prior to submains or branching lines, such as recreational areas (baseball and soccer fields), parks, golf courses, commercial hubs, edge of residential subdivision or new development (but not including distribution service lines to each business or household or fairway).
3. Decentralized reuse costs associated with separate treatment facilities within local/community scale non-wastewater collection, treatment, storage, and pumping that result in the development of new supply (**includes supply development within** the WUG's distribution system).
4. Onsite greywater reuse and onsite stormwater/rainwater harvesting costs that include storage, treatment, and pumping for each system or building.
5. Treatment costs for onsite systems.

Figure 2 – Eligible and Ineligible Reuse Components for inclusion in Regional Water Plans



Conservation - water loss mitigation

1. Costs are associated with metering or other best management practices that will result in immediate reduction in the use of or loss of water; or
2. Costs are associated with replacement of only those portions of water lines in an existing retail water distribution system service area that for the primary purpose of addressing significant, measurable, water loss, and:
 - a. the proposed replacement water line(s) is not more than two, standard pipe diameters larger than the existing line proposed to be replaced. For example, replacement of an existing 6-inch water line with a 12-inch line may not be included in the water plan since it is more than 2 diameters larger (i.e., larger than both 8-inch and 10-inch);⁵⁴

⁵⁴ For the purposes of state water planning, water line upsizing over two diameters is considered an indication that the primary purpose of the line replacement is to increase the volume of water being delivered rather than reduction of water loss.

- b. the proposed water line replacement will provide an immediate, quantifiable increase in water supplies; and,
- c. the primary purpose of the project is to achieve water conservation savings.⁵⁵

If the distribution line replacement for the water conservation strategy is subject to adopted utility standard minimum size requirements that exceed two standard pipe diameters, the water management strategy evaluation must note the specific utility standard and include

1. a map of the proposed line replacement; and,
2. detailed water loss calculations before and after the proposed line replacement.

2.5.2.15 Infrastructure/costs that may not be included in regional water plans

If an infrastructure component is not required to increase the treated water supply volume delivered to an entity either as new supply or through demand reduction, then the component and its costs may not be included in the RWP. Types of items and associated cost that may not be incorporated into a RWP include, but are not limited to

1. new facilities associated with internal distribution networks. (e.g., retail distribution within a WUG's system) and that do not convey additional water supply volumes to a WUG;
2. internal distribution facilities prior to sewage collection points (i.e., prior to the last sewer intercept) or after the first reuse delivery point, including those associated with direct reuse water (per 31 TAC §357.34(e)(3)(A)). For direct reuse, internal distribution lines just prior to the first service connection are considered outer distribution lines (sub mainlines or lateral/branching lines) such as individual service lines to individual homes or businesses and may not be included in the regional plan;
3. wastewater collection systems associated with a wastewater treatment plant that provides direct reuse project water;
4. costs associated with outer distribution system components that deliver treated reclaimed water to individual end users for decentralized reuse;
5. costs associated with collection or distribution for onsite systems;
6. water system improvements to address compliance issues related to water quality or water distribution pressure;
7. new wells that are required simply to replace aging wells (i.e., maintenance);
8. maintenance of, or upgrades to, existing equipment or facilities that do not directly increase volumetric water supply (e.g., for improving water treatment processes at existing water treatment plants; replacement of electrical systems; replacement of pumps; or installation of cathodic protection on existing facilities);

⁵⁵ Conservation strategies should not be based on potential water savings that are only ancillary benefits of a non-conservation project. For example, replacing existing small diameter water lines with much larger lines to increase delivery of water in a distribution system may often entail a small side-benefit of reducing at least some water losses but is not a sufficient basis for inclusion of the project as a conservation capital cost in a regional water plan. The impracticality of labelling such a project as a conservation strategy may also be indicated by a noticeably higher unit cost of conserved water.

9. preventative measures to protect or maintain dam infrastructure against future water loss or degradation; and,
10. water storage facilities directly associated with retail water distribution networks (e.g., elevated storage tank).

RWPs must not include any strategies or costs that are associated with

1. simply maintaining existing water supplies;
2. replacing existing infrastructure for maintenance or compliance;
3. expanding water distribution system capacity or the distribution network, for example, to address compliance issues related to water quality or water pressure, or to reach new retail development areas;
4. delivering greater volumes of water within the distribution system for the purpose of addressing increased system growth of new retail developments; or
5. delivering greater volumes of water within the distribution system for the purpose of existing or future fire protection.

2.5.3 Allocating water management strategy supplies

A WMS's source will have an availability that will reflect the full drought of record firm yield/firm diversion. The availability associated with a WMS/WMSP must be allocated to WUGs and/or WWP as future supplies as appropriate, in accordance with the following:

1. Fully allocated to the WUGs and/or WWP WUG customers
2. Partially allocated to WUGs and/or WWP WUG customers and the remainder allocated to entities representing the unassigned water volumes
3. Remain unallocated, by associating the water volumes with an 'unassigned water volume entity' that represents the entity that sponsored the development of the water

For any recommended water management strategies where the strategy supply volume remains 100 percent unallocated to water user groups, the RWPG must explain in the RWP why the strategy is recommended but not assigned to any beneficiaries.

2.5.4 Recommended and alternative water management strategies and water management strategy projects

RWPGs must recommend WMSs separately from WMSPs although they are often interrelated. The IPP and final RWP must include documentation of the RWPGs process for selecting recommended WMSs and WMSPs. This may include for example, the consideration of evaluation matrices in comparison to specific WUG criteria. This information may be presented in flowchart form or a discussion of the assumptions the planning group considers in deciding to recommend a certain WMS or WMSP.

Chapter 5 of the IPP and final RWP must include a table or list of all recommended WMS and WMSPs.

All alternative WMSs must be fully evaluated based on criteria specified in 31 TAC §357.34 & §357.35. Technical evaluations of each alternative WMS must have a generally defined



Attachment 2

Plateau Region Potentially Feasible Water Management Strategies

List of Potentially Feasible Water Management Strategies Considered for the Development of the 2026 Plateau Water Plan

County	Water User Group	Strategy
Bandera	City of Bandera	Reuse treated wastewater effluent for irrigation of public spaces
		Promote, design & install rainwater harvesting systems on public buildings
		Additional Lower Trinity well and lay necessary pipeline ALTERNATE
		Additional Middle Trinity wells within City water infrastructure area
		Surface water acquisition, treatment and ASR
	*Bandera County FWSD #1	Public conservation education
	*Bandera County Other – Bandera River Ranch #1	Additional groundwater well
	*Bandera County Other – Lake Medina Shores	Water loss audit and main-line repair for
	*Bandera County Other - Medina WSC	Public conservation education
	Bandera County Other	Additional groundwater wells ALTERNATE
	Bandera County Other – Volunteer Fire Dept.	Public conservation education
	Bandera County Other - Enchanted River Estates	Additional groundwater well
	Bandera County Other	Drought management (BCRAGD)
	*Bandera County Irrigation	Additional groundwater wells to provide emergency supply ALTERNATE
	*Bandera County Livestock	Water loss audit and main-line repair
Edwards	City of Rocksprings	Drought management (BCRAGD)
Edwards	Edwards County Other (Barksdale WSC)	Irrigation scheduling
Edwards	*Edwards County Mining	Additional groundwater wells
Edwards	*Edwards County Mining	Additional groundwater well
Edwards	*Edwards County Mining	Additional groundwater well
Edwards	*Edwards County Mining	Additional groundwater wells
Kerr	*City of Kerrville	Livestock conservation
Kerr	*City of Kerrville	Additional groundwater well
Kerr	*City of Kerrville	Livestock conservation
Kerr	*City of Kerrville	Additional groundwater well
Kerr	*City of Kerrville	Additional groundwater well
Kerr	*City of Kerrville	Increased wastewater reuse
Kerr	*City of Kerrville	Water loss audit and main-line repair
Kerr	*City of Kerrville	Explore and develop new Ellenburger Aquifer well supply
Kerr	*City of Kerrville	Increased water treatment and ASR capacity
Kerr	Kerr County Other - Eastern Kerr County Regional Water Supply Project	Project 1. Construction of an Ellenburger Aquifer water supply well
Kerr	Kerr County Other - Eastern Kerr County Regional Water Supply Project	Project 2. Construction of off-channel surface water storage
Kerr	Kerr County Other - Eastern Kerr County Regional Water Supply Project	Project 2. Construction of surface water treatment facilities and transmission lines
Kerr	Kerr County Other - Eastern Kerr County Regional Water Supply Project	Project 3. Construction of ASR facility
Kerr	Kerr County Other - Eastern Kerr County Regional Water Supply Project	Project 4. Construction of Trinity Aquifer wellfield for dense, rural areas
Kerr	Kerr County Other - Eastern Kerr County Regional Water Supply Project	Project 4. Construction of desalination plant

(continued) List of Potentially Feasible Water Management Strategies Considered for the Development of the 2026 Plateau Water Plan

County	Water User Group	Strategy
Kerr	Kerr County Other - *Center Point	Public conservation education
		Purchase water from EKCRWSP
	Kerr County Other - *Center Point Taylor System	Public conservation education
		Purchase water from EKCRWSP
	Kerr County Other - Verde Park Estates	Water loss audit and main-line repair
	*Kerr County Other	Public conservation education
	*Kerr County Livestock	Livestock conservation
		Additional groundwater wells ALTERNATE
		Livestock conservation
		Additional groundwater wells ALTERNATE
		Livestock conservation
Additional groundwater well ALTERNATE		
Livestock conservation		
*Kerr County Mining	Additional groundwater wells	
Kinney	City of Brackettville	Increase supply to Spofford with new water line
		Increase storage facility
	Fort Clark Springs MUD	Water loss audit and main-line repair
		Increase storage facility
Real	*City of Camp Wood	Public conservation education
		Additional groundwater wells
	City of Leakey	Additional groundwater well
		Develop interconnections between wells within the City
	Real County Other - Real WSC	Water loss audit and main-line repair
Real County Other - Oakmont Saddle Mountain WSC	Additional groundwater well	
Val Verde	*City of Del Rio	Water loss audit and main-line repair
		Additional groundwater well
		Water treatment plant expansion
		Develop a wastewater reuse program
	Laughlin Air Force Base	Purchase water from City of Del Rio
	Val Verde County Other - Val Verde County WCID Comstock	Water loss audit and main-line repair
	Val Verde County Other - San Pedro Canyon Upper Subdivision	Water loss audit and main-line repair
	Val Verde County Other - Tierra Del Lago	Water loss audit and main-line repair
*Val Verde County Mining	Additional groundwater wells	

Attachment 3

Methodology for Identifying and Selecting Potentially Feasible Water Management Strategies

PROCESS FOR IDENTIFYING AND SELECTING POTENTIALLY FEASIBLE WATER MANAGEMENT STRATEGIES TO BE EVALUATED FOR THE 2026 PLATEAU WATER PLAN

Strategy Types

As required by TWC §16.053(e)(5) and TAC §357.34(c) the regional water plan must consider, **but not be limited to**, the following potentially feasible water management strategies:

1. Conservation
2. Drought management
3. Reuse
4. Management of existing water supplies
5. Conjunctive use
6. Acquisition of available existing water supplies
7. Development of new water supplies
8. Developing regional water supply facilities or providing regional management of water supply facilities
9. Developing large-scale desalination facilities for seawater or brackish groundwater that serve local or regional brackish groundwater production zones identified and designated under TWC §16.060(b)(5)34
10. Developing large-scale desalination facilities for marine seawater that serve local or regional entities
11. Voluntary transfer of water within the region using, but not limited to, contracts, water marketing, regional water banks, sales, leases, options, subordination agreements, and financing agreements
12. Emergency transfer of water under TWC §11.139
13. Interbasin transfers of surface water
14. System optimization
15. Reallocation of reservoir storage to new uses
16. Enhancements of yields
17. Improvements to water quality
18. New surface water supply
19. New groundwater supply
20. Brush control
21. Precipitation enhancement
22. Aquifer storage and recovery
23. Cancellation of water rights
24. Rainwater harvesting

Other potential projects considered for the initial list included:

- appropriate strategies from the *2021 Plan*
- water-loss audits and line replacement
- projects suggested by municipalities through a survey
- projects that are currently or have recently applied to the TWDB for funding

Needs Analysis

1. Receive a *Needs Analysis Report* from the TWDB, which provides a comparison of existing water supplies and projected water demands for each water user group (WUG) and wholesale water provider (WWP) in the Region. Based on this comparison, the report identifies WUGs and WWPs that are expected to experience needs for additional water supplies within the 50-year time frame of the regional water plan.

Identification and Selection Process

2. Review the potential infeasibility and implementation status identifying:
 - If strategy contemplates permitting and/or construction;
 - If strategy is near-term or necessitates significant time for implementation;
 - If the potential sponsor(s) have taken, or have indicated they will take, affirmative steps towards the strategy's implementation. Affirmative steps may include, but not be limited to:
 - a. Spending money on the strategy or project;
 - b. Voting to spend money on the strategy or project;
 - c. Applying for a federal or state permit for the strategy or project
3. Review and consider recommended water management strategies adopted by the water planning group for the *2021 Plateau Water Plan*.
4. Review and consider any issues identified in the most current TWDB Water Loss Audit Report, including leak detection and supply side analysis.
5. Solicit current water planning information, including specific water management strategies of interest from WUGs and WWPs with identified needs.
6. Review and consider the most recent Water Supply Management, Water Conservation, and/or Drought Contingency Plans, where available, from WUGs and WWPs with identified needs.
7. 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
 - g. Drought management
 - 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
8. Consider other *potentially feasible water management strategies* suggested by planning group members, stakeholders, and the public.
 9. 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
 10. 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.