

AGENDA
Lower Colorado Regional Water Planning Group
Water Modeling Committee Meeting

Freese and Nichols, 10431 Morado Circle, Building 5, Suite 300,
Conference Room “Capital of Texas”, Austin, Texas 78759

August 21, 2023, 10:00 a.m.

Committee Members need to attend meeting in person. The following link is being provided for virtual attendance by non-committee members. Virtual attendees will be able to provide public comment under Agenda Items #3 and #10.

Virtual attendance link:

https://teams.microsoft.com/l/meetup-join/19%3ameeting_NzRiYWUxMGEtODNiZi00YmU0LWEzZjYtNjVmY2FhNTQ5ZDJh%40thread.v2/0?context=%7b%22Tid%22%3a%22191657ea-bcff-4385-9d04-659ef9cee515%22%2c%22Oid%22%3a%2249111dd8-74af-4196-906b-20a2cf201a39%22%7d

Committee Meeting:

1. Call to order – Chair Teresa Lutes
2. Welcome and introductions – Chair Lutes
3. Receive public comments on specific issues related to agenda items 4 through 9 – limited to 3 minutes per person
4. Discuss Region K Cutoff Model and assumptions for hydrologic variance request to Texas Water Development Board (TWDB) including:
 - Review of draft updated Region K Cutoff Modeling Assumptions Regarding Supply and Strategy Analyses for 2026 Regional Plan Development table (to be attachment table for hydrologic variance request)
5. Take action as appropriate on Region K Cutoff Model and assumption recommendations for current planning cycle for hydrologic variance request to TWDB
6. Review and discuss TWDB guidelines related to uncertainty and Drought(s) Worse Than the Drought of Record (DWDOR)
7. Discuss how groundwater modeling and Modeled Available Groundwater (MAG) data feed into groundwater availability/supply estimates (time permitting)
8. Next meeting date – September 18, 2023, 1:00 pm
9. Future agenda items – potential items include: discuss and make recommendation on draft TWDB hydrologic variance request, make recommendation regarding uncertainty and DWDOR approaches

10. General public comments – limited to 3 minutes per person

11. Adjourn

DRAFT

August 21, 2023

10:00 AM

Region K Water Modeling Committee Meeting



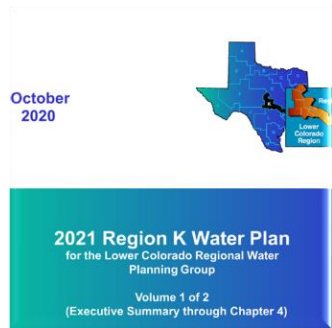
Agenda Item 4

Discuss Region K Cutoff Model and assumptions for hydrologic variance request to Texas Water Development Board (TWDB)



Agenda Item 4

Region K Cutoff Model and Hydrologic Variance Request Differences between TCEQ Colorado WAMs



TCEQ WAM – 2021 Plan

- Interruptible Stored Water for Ag based on LCRA 2015 WMP
- Environmental Flows criteria based on LCRA 2015 WMP
- Period of record 1940-2016

TCEQ WAM – 2026 Plan

- Interruptible Stored Water for Ag based on LCRA 2020 WMP
- Environmental Flows criteria based on LCRA 2020 WMP
- Period of record 1940-2016
- 20 new, 7 deleted and 1 modified control point
- 40 new, 0 deleted and 26 modified water rights *records*
- 10 new Instream Flow reference points

Agenda Item 4

Region K Cutoff Model and Hydrologic Variance Request

Process of TCEQ WAM to Region K WAM



TCEQ releases
WAMs for each
basin (“TCEQ
WAM”)

RWPGs
review for
their
purposes

RWPGs submit
Hydrologic
Variance Request
(HVR) to TWDB

TWDB
reviews
HVRs

TWDB responds to
HVR, modified
model (“Region K
WAM”)

RWPG runs
analyses on
Region K
WAM

Agenda Item 4

Region K Cutoff Model and Hydrologic Variance Request

Examples that Require an HVR



- Corrections for errors
- Changes that reflect actual operation of a source
- Addition of subordination or other agreements
- Use of a yield other than firm yield
- Extension of hydrology
- Adding return flows in supply analysis
- Use of an alternative model

Region K Cutoff Model and Hydrologic Variance Request

Examples that Require an HVR

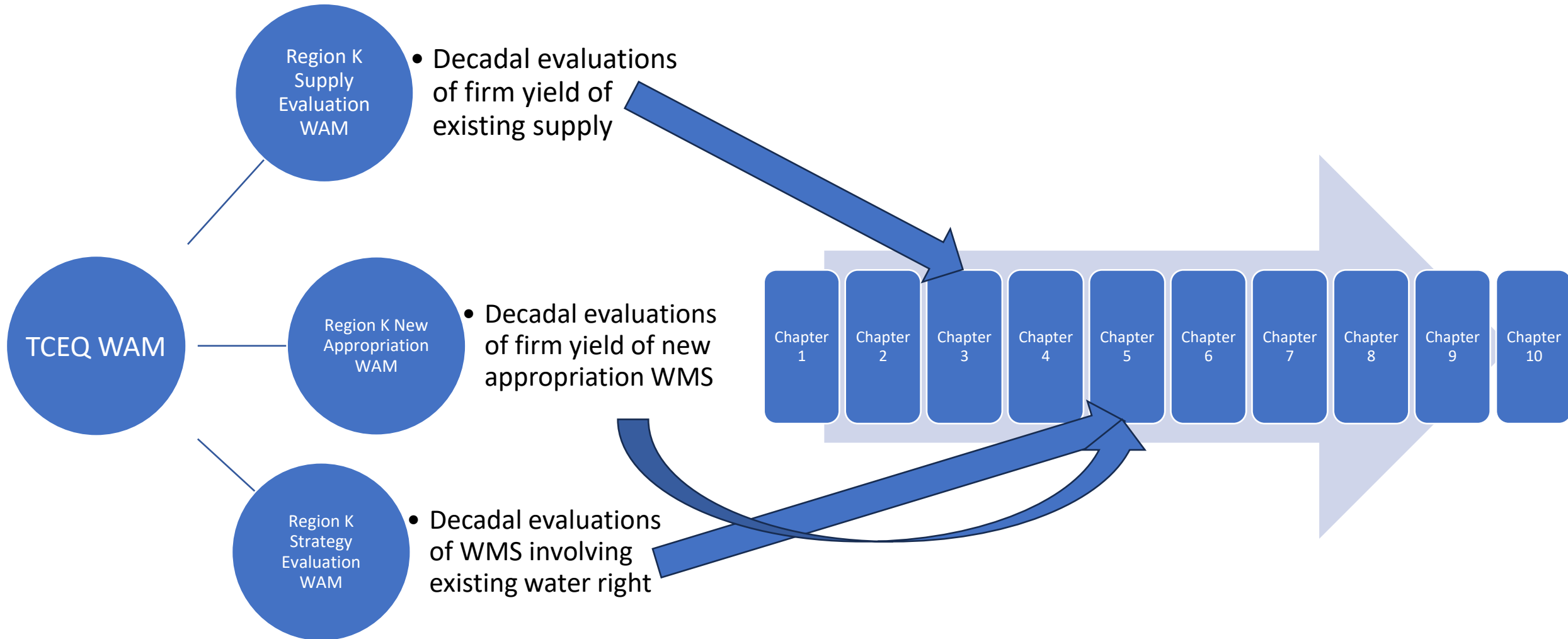


- Corrections for errors
- Changes that reflect actual operation of a source
- Addition of subordination or other agreements
- Use of a yield other than firm yield
- Extension of hydrology
- Adding return flows in supply analysis
- Use of an alternative model

Agenda Item 4

Region K Cutoff Model and Hydrologic Variance Request

Variations of TCEQ WAM for Region K's Purposes



Region K Cutoff Model and Hydrologic Variance Request

Major Variance Requests



Region K Supply Evaluation WAM

- Modifications to TCEQ WAM include:
 - Region K cutoff assumptions
 - No 2020 LCRA WMP interruptible supplies
 - No 2020 LCRA WMP environmental criteria
 - Sedimentation projections by decade

Region K New Appropriation WAM

- TCEQ WAM includes:
 - Priority order analysis (no cutoff)
 - 2020 LCRA Water Management Plan (WMP)
 - Authorized storage capacities (no adjustment for sedimentation)
 - No external agreements

Region K Strategy Evaluation WAM

- Modifications to TCEQ WAM include:
 - Region K cutoff assumptions
 - LCRA interruptible supplies and environmental flow support (with curtailment triggers in future decades)
 - Sedimentation projections by decade
 - Return flows are only considered when evaluating strategies

Agenda Item 4

Region K Cutoff Model and Hydrologic Variance Request



Review draft updated Region K Cutoff Modeling
Assumptions Regarding Supply and Strategy
Analyses for 2026 Regional Plan Development table

Agenda Item 5

**Take action as appropriate on
Region K Cutoff Model and
assumption recommendations for
current planning cycle for hydrologic
variance request to TWDB**



Agenda Item 6

Review and discuss TWDB guidelines related to uncertainty and Drought(s) Worse Than the Drought of Record (DWDOR)



Agenda Item 6

Uncertainty and Drought(s) Worse Than the Drought of Record (DWDOR)



- 2021 Region K Plan includes policy recommendation on planning for DWDOR
- For 2026 plan development, TWDB provided updated guidelines including uncertainty and DWDOR
- https://www.twdb.texas.gov/waterplanning/rwp/planningdocs/2026/projectdocs/2026RWP_ExhibitC.pdf
- New subsection in Chapter 7 of the regional water plan

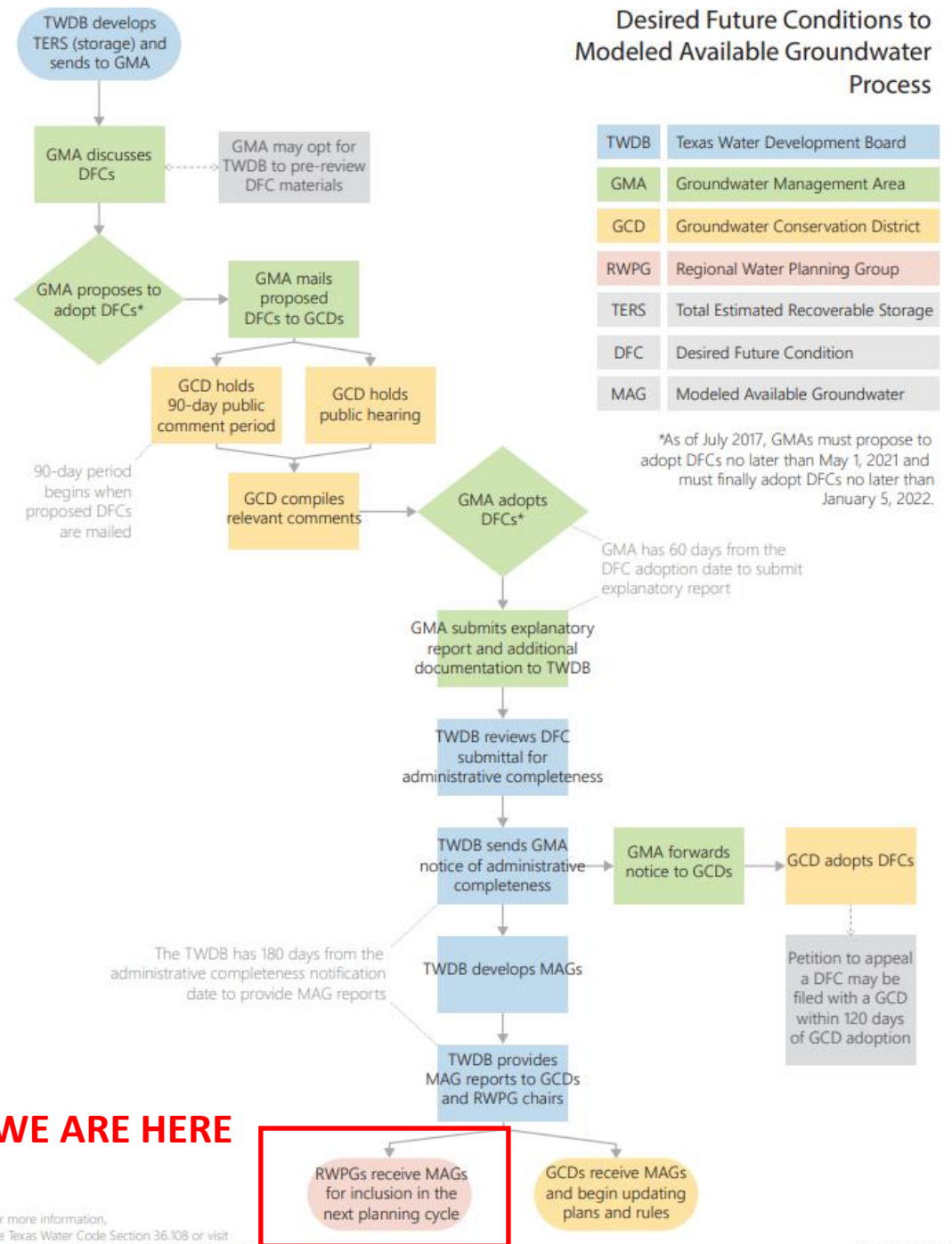
Agenda Item 7

Discuss how groundwater modeling and Modeled Available Groundwater (MAG) data feed into groundwater availability/supply estimates



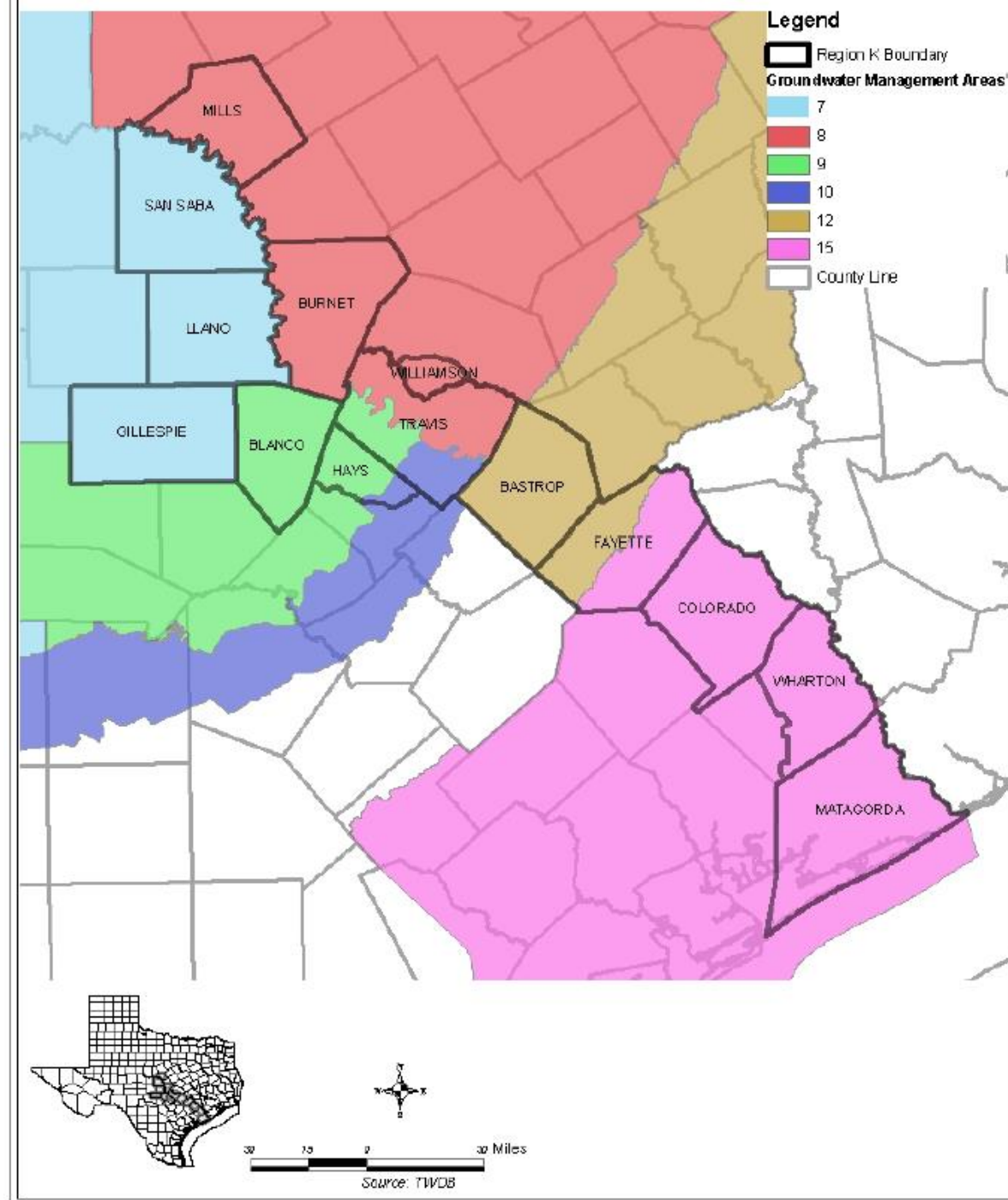
Groundwater Planning

- Groundwater Management Areas (GMAs) set Desired Future Conditions (DFCs) which is a “future state of the aquifer”
- Texas Water Development Board runs groundwater models to determine how much pumping can occur while meeting DFCs
 - This pumping is called “modeled available groundwater” (MAG)
 - MAG values were available early 2023, and finalized/amended in May 2023



GMA in Region K

- GMAs 7, 8, 9, 10, 12, 15



How are the MAGs Used in Regional Planning?

- If a MAG has been established for a particular aquifer, the TWDB requires that the MAG be considered the maximum amount of groundwater available
- Where a MAG is not established for an aquifer, the local GCD or GMA representative should be consulted regarding an appropriate availability volume
- Some flexibility by decade is available through “MAG peaking factors”



Modeled Available Groundwater (MAG) Peak Factor

Texas Water Code (TWC) §36.1132 requires management of groundwater production on a long-term basis to achieve applicable desired future conditions. In practice, this may include variations in pumping from year to year, for example, in response to relative wet and dry periods. Modeled available groundwater (MAG) is the amount of water that the Texas Water Development Board (TWDB) Executive Administrator determines may be produced on an average annual basis to achieve a desired future condition. Most of the MAG values were developed using groundwater availability models calibrated for long-term average, not drought of record, conditions.

In response to stakeholder concerns during the fourth cycle of regional water planning, the TWDB revised its planning rules to include a MAG Peak Factor that ensures regional water plans have the ability to fully reflect how, under current statute, groundwater conservation districts anticipate managing groundwater production under drought conditions.¹

What is the MAG Peak Factor?

The purpose of the MAG Peak Factor is to

- provide reasonable flexibility and temporary accommodation of increased groundwater pumping above the MAG;
- accommodate anticipated fluctuations in pumping between wet and dry periods, or to account for other shifts in the timing of pumping while remaining consistent with desired future conditions;
- allow regional water planning groups to develop plans that reflect more realistic drought condition groundwater availability and pumping, where appropriate; and
- maintain the integrity of the regional and state water planning process.

The use of proposed MAG Peak Factors requires review and approval by relevant groundwater conservation districts, groundwater management areas, regional water planning groups, and the TWDB Executive Administrator.

Subject to many factors, the MAG Peak Factor might be considered in instances, for example, where

- actual pumping in wetter years is expected to fall below the MAG, thereby allowing intermittent pumping of volumes greater than the MAG during drought; or,

- groundwater pumping in early decades is expected to consistently remain well below the MAG, thereby accommodating pumping volumes somewhat higher than the MAG in later decades—all while achieving the desired future condition.

The MAG is the amount of water that can be produced on an annual average basis, instead of the amount that can be permitted. Groundwater conservation districts must consider MAGs, along with other factors in TWC §36.1132, when issuing permits for groundwater production. Accordingly, the MAG Peak Factor reflects groundwater available for pumping, not permitting, and is utilized for regional water planning purposes only. The MAG Peak Factor is not intended as a limit to permits or as guaranteed approval or pre-approval of any future permit application.

How does the process work?

It is not a mandatory requirement that regional water planning groups utilize MAG Peak Factors in the development of their regional water plans. Rather, it is the decision of each planning group, in concurrence with the relevant groundwater conservation district and groundwater management area, to determine what, if any, MAG Peak Factor is appropriate for planning efforts. A groundwater conservation district may also initiate the use of the MAG Peak Factor. The definition specifies that a MAG Peak Factor would be expressed as a percentage of modeled available groundwater (e.g., greater than 100 percent) and would represent the quantified annual groundwater availability for planning purposes.

Regional water planning groups must request the TWDB Executive Administrator's approval of each MAG Peak Factor. Each planning group request for MAG Peak Factors must

- include written approval from both the relevant groundwater conservation district, if one exists within the particular aquifer-region-county-basin split, and representatives of the groundwater management area;
- include the technical basis for the request in sufficient detail to support groundwater conservation district, groundwater management area, and the Executive Administrator evaluation; and
- document how the MAG Peak Factor will not prevent the associated groundwater conservation district(s) from managing groundwater resources to achieve the desired future condition(s).

MAGs by Aquifer (pivot table from TWDB, filtered to Region K)



RWP27 Aquifer Name	Availability Sum 2030	Availability Sum 2040	Availability Sum 2050	Availability Sum 2060	Availability Sum 2070	Availability Sum 2080
⊗ Carrizo-Wilcox Aquifer	51,818	56,324	60,815	65,571	70,734	70,734
⊗ Cross Timbers Aquifer	-	-	-	-	-	-
⊗ Edwards-BFZ Aquifer	21,417	21,417	21,417	21,417	21,417	21,417
⊗ Edwards-Trinity-Plateau Aquifer	-	-	-	-	-	-
⊗ Edwards-Trinity-Plateau, Pecos Valley, and Trinity Aquifers	4,979	4,979	4,979	4,979	4,979	4,979
⊗ Ellenburger-San Saba Aquifer	27,178	27,181	27,178	27,181	27,178	27,181
⊗ Gulf Coast Aquifer System	222,149	222,438	222,766	223,142	223,415	223,345
⊗ Hickory Aquifer	14,817	14,818	14,817	14,818	14,817	14,818
⊗ Marble Falls Aquifer	7,127	7,139	7,127	7,139	7,127	7,127
⊗ Other Aquifer	14,790	14,790	14,790	14,790	14,790	14,790
⊗ Queen City Aquifer	3,234	3,310	3,393	3,484	3,584	3,584
⊗ Sparta Aquifer	3,216	3,312	3,440	3,616	3,825	3,825
⊗ Trinity Aquifer	30,894	30,882	30,867	30,837	30,837	30,837
⊗ Yegua-Jackson Aquifer	9,984	9,984	9,983	9,983	9,983	9,983
Grand Total	411,603	416,574	421,572	426,957	432,686	432,620

Some MAGs Have Changed from the Previous Cycle (first look, comparison provided by TWDB)



Planning Region	K	
Row Labels	AvailabilityDifference2030	AvailabilityDifference2070
Carrizo-Wilcox Aquifer	22,119	36,157
Edwards-BFZ Aquifer	7,293	7,293
Edwards-Trinity-Plateau, Pecos Valley, and Trinity Aquifers	-	-
Ellenburger-San Saba Aquifer	8	8
Gulf Coast Aquifer System	2,374	6,986
Hickory Aquifer	2	2
Marble Falls Aquifer	2	2
Queen City Aquifer	(15)	390
Sparta Aquifer	(513)	127
Trinity Aquifer	1,791	1,792
Yegua-Jackson Aquifer	722	722
Grand Total	33,783	53,479

**SUMMARY OF REGION K CUTOFF MODEL MODELING ASSUMPTIONS
REGARDING SUPPLY AND STRATEGY ANALYSES
FOR ~~2021-2026~~ REGIONAL PLAN DEVELOPMENT**

DRAFT FOR REVIEW

NO.	ASSUMPTION	(1)	(2)	(3)	Change from 2016-2021 Planning Cycle
		SUPPLY ANALYSIS Region K Cutoff Model by Decade	STRATEGY ANALYSIS TCEQ Full-Basin WAM Run 3	Region K Cutoff Model by Decade	
1	Use TCEQ Full-Basin WAM Run 3 Without Modification for New Appropriation Water Supply Strategies Analysis	No	Yes	No	No Change
2	All Rights at and Above Ivie/Brownwood Senior-simulated prior to Downstream Rights (maintaining relative date priority in rights upstream)	Yes	No	Yes	No Change
3	Use Expanded 1940-2016 Naturalized Flows	Yes	No	Yes	Extended hydrology period to 2016 No Change
4	Determine Firm Yield for Buchanan-Travis Reservoir System	Yes	No	No	No Change
5	Use Sediment-Adjusted Future Reservoir Storage by Decade	Yes	No	Yes	No Change
6	Use 2015-2020 Water Management Plan Environmental Flow Criteria	No*	Yes	Yes	Changed " 20102015 " to " 20152020 "; Added a footnote for clarification
7	Set All Water Right Demands at Authorized Diversion Amounts	Yes	Yes	No	No Change
8	Include Provisions of LCRA-STP 2006 Settlement Agreement	Yes	No	Yes	No Change
9	Include Operating Rules for Lakes Buchanan and Travis to Reflect Combined Firm Yield Operation	Yes	Yes	Yes	Revised "Maintain Consistent Levels of Drawdown in the Lakes" to say "Reflect Combined Firm Yield Operations" No Change
10	Include Latest Approved LCRA -Permits and Amendments (as of December 2017 [need to update this date])	Yes	Yes	Yes	Added "(as of December 2017)"Updated to include latest approved permits and amendments in general, not just LCRA's and updated date to [need to update this date]
11	Include 2015-2020 Water Management Plan Highland Lakes Interruptible Water	No	Yes	Yes	Changed " 20102015 " to " 20152020 "
12	Adjust 2015-2020 Water Management Plan Environmental Flow Triggers (Decadal)	No	No	Yes	Changed " 20102015 " to " 20152020 "; Added "(Decadal)" for clarification
13	Set All Region K Municipal and Industrial Water Right Demands at Projected Future Demand Amounts by Decade	No	No	Yes	Expanded "M&I" to "Municipal and Industrial" for clarification No Change
14	Modify Curtailment of Highland Lakes Interruptible Water as Necessary to Satisfy LCRA Future Firm Municipal and Industrial Demands	No	No	Yes	Expanded "M&I" to "Municipal and Industrial" for clarification No Change
15	Set LCRA Lower Basin Irrigation Demands Equal to Projected Future Demands by Decade	No	No	Yes	Removed "Weather Variable" after the word "Future" No Change
16	Include LCRA Irrigation Return Flows to the Colorado River	No	No	Only As A Strategy	No Change
17	Include Return Flows from Austin Wastewater Treatment Plants	No	Only As A Strategy	Only As A Strategy	No Change
18	Include Other Municipal and Industrial Return Flows	No	Only As A Strategy	Only As A Strategy	Expanded "M&I" to "Municipal and Industrial" for clarification No Change
19	Include Reuse Provisions and Environmental Flow Requirements of LCRA-Austin 2007 Settlement Agreement	No	Only As A Strategy	Only As A Strategy	No Change

* The LCRA ~~2015-2020~~ Water Management Plan states that the amount of firm water allocated for environmental purposes is 33,440 acre-feet per year (10-year average). This amount is a commitment from the firm yield of the Highland Lakes.

Note: TCEQ SB-3 requirements will be taken into consideration in strategies involving a new appropriation of water.

Surface Water Hydrologic Variance Request Checklist

Texas Water Development Board (TWDB) rules¹ require that regional water planning groups (RWPG) use most current Water Availability Models (WAM) from the Texas Commission on Environmental Quality (TCEQ) and assume full utilization of existing water rights and no return flows for surface water supply analysis. Additionally, evaluation of existing stored surface water available during Drought of Record conditions must be based on Firm Yield using anticipated sedimentation rates. However, the TWDB rules also allow, and **we encourage**, RWPGs to use more representative, water availability modeling assumptions; better site-specific information; or justified operational procedures other than Firm Yield with written approval (via a Hydrologic Variance) from the Executive Administrator in order to better represent and therefore prepare for expected drought conditions.

RWPGs must use this checklist, which is intended to save time and reduce effort, to request a Hydrologic Variance for estimating the availability of surface water sources. For Questions 4 – 10, please indicate whether the requested variance is for determining Existing Supply, Strategy Supply, or both. Please complete a separate checklist for each river basin in which variances are being requested.

Water Planning Region: K

1. Which major river basin does the request apply to? Please specify if the request only applies part of the basin or only to certain reservoirs.

Lower Colorado Basin (downstream of O.H. Ivie Reservoir and Lake Brownwood).

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

Region K uses three variations of the Colorado WAM:

- *Region K Supply Evaluation Model.* This is used for the decadal supply evaluations that will be reported in Chapter 3. This includes the yield of the LCRA system. Modifications to TCEQ WAM include:
 - Region K Cutoff assumptions
 - No LCRA interruptible supplies or environmental flow support
 - Sedimentation projections by decade

¹ 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

- *Region K New Appropriation Model.* This model is TCEQ's Run 3 with an error correction (see below). This will be used for any strategies that require a new appropriation. Modifications to TCEQ WAM include:
 - Priority order analysis (no cutoff)
 - 2020 LCRA Water Management Plan (WMP)
 - Authorized storage capacities (no adjustments for sedimentation)
 - No external agreements
- *Region K Strategy Evaluation Model.* This model will be used to evaluate strategies that a) do not require a new appropriation (i.e. strategies based on existing water rights), and/or b) for strategies that use a new appropriation evaluated with the New Appropriation Model to meet a specific need. Modifications to TCEQ WAM include:
 - Region K Cutoff assumptions
 - LCRA interruptible supplies and environmental flow support. For future decades, we may need to adjust curtailment triggers from the 2020 LCRA WMP modeling to protect firm supplies.
 - Sedimentation for current and future decades
 - Return flows are only considered when evaluating strategies

The Region K Cutoff assumptions modify the priority assumptions in Run 3 and is included in the Supply Evaluation and Strategy Evaluation models. These models assume that all water rights at and above Lakes O.H. Ivie and Brownwood are simulated prior to downstream water rights while maintaining relative date priority in rights upstream. This assumption reflects historical and current water management operational practices between the upper and lower Colorado Basin, and is therefore a better basis for planning. The cutoff models show increased water availability upstream of Lakes O.H. Ivie and Brownwood in Region F and decreased availability downstream in Region K.

The Region K Supply Evaluation Model does not include interruptible supplies because:

- a). TWDB Regional Planning Rules require (and Region K agrees) that supply estimates be made for firm yield conditions with all water rights fully utilized.
- b). Imposing LCRA's 2020 WMP operation into the supply analysis does not align with the directive to use firm yield.

The Region K Supply Evaluation Model represents the environmental flow support as a commitment of 33,440 ac-ft/year from the firm yield of the Highland Lakes. This is consistent with how LCRA represents its commitment to environmental flows from the firm yield of the system.

The projected conditions within the Region K Strategy Evaluation does include both interruptible supplies and environmental flow support from the 2020 LCRA WMP. The curtailment triggers from the 2020 WMP may need to be modified to protect firm supplies as demand increases.

More details on these modifications may be found in the summary table in Attachment A.

All the models will include corrections associated with the control point locations for the Twin Buttes/Nasworthy system. Twin Buttes Reservoir is incorrectly located, and the evaporation for

Lake Nasworthy is entered at the wrong control point, so no evaporative loss is applied at Lake Nasworthy. These errors have been identified in previous modeling efforts but have not been incorporated into TCEQ's WAM Run 3 at this time.

3. Was this request submitted in a previous planning cycle? If yes, please indicate which cycle and note how it is different, if at all, from the previous request?

Yes

Only changes from request submitted for the 2016 Region K Plan is changing the LCRA WMP cited to be the 2020 WMP and corrections at Twin Buttes/Nasworthy.

4. Are you requesting to extend the period of record beyond the current applicable WAM hydrologic period? If yes, please describe the proposed methodology. Indicate whether you believe there is a new drought of record in the basin.

No

Choose an item.

No request is being made to extend the period or record beyond the Colorado WAM hydrologic period which covers 1940-2016. The basin is currently experiencing drought conditions. However, no determination of a new drought of record has been made at the time of this variance request.

5. Are you requesting to use a reservoir safe yield? If yes, please describe in detail how the safe yield would be calculated and defined, which reservoir(s) it would apply to, and why the modification is needed or preferable for drought planning purposes.

No

Choose an item.

Click or tap here to enter text.

6. Are you requesting to use a reservoir yield other than firm yield or safe yield? If yes, please describe, in a bulleted list, each modification requested including how the alternative yield was calculated, which reservoir(s) it applies to, and why the modification is needed or preferable for drought planning purposes. Examples of alternative reservoir yield analyses may include using an alternative reservoir level, conditional reliability, or other special reservoir operations.

No

Choose an item.

Click or tap here to enter text.

7. Are you requesting to use a different model (such as a RiverWare or Excel-based models) than RUN 3 of the applicable TCEQ WAM? If yes, please describe the model being considered including how it incorporates water rights and prior appropriation and how it is more conservative than RUN 3 of the applicable TCEQ WAM.

No

Choose an item.

Click or tap here to enter text.

8. Are you requesting to use a modified TCEQ WAM? If yes, please describe in a bulleted list all modifications in detail including all specific changes to the WAM and whether the modified WAM is more conservative than the TCEQ WAM RUN 3. Examples of WAM modifications may include adding subordination agreements, contracts, updated water rights, modified spring flows, updated lake evaporation, updated sedimentation², system or reservoir operations, or special operational procedures into the WAM.

Yes

Existing and Strategy Supply

The following assumptions are also summarized in the table in Attachment A.

- All rights at and above Ivie/Brownwood are simulated prior to downstream rights (“Cutoff Assumptions”)
- Determine Firm Yield for Buchanan-Travis Reservoir System (Yes for Supply Analysis, No for Strategy Analysis)
- Use reservoir storage with adjustment for sedimentation projections by decade
- Include provisions of LCRA-STP 2006 Settlement Agreement
- Include operating rules for Lakes Buchanan and Travis to reflect combined Firm Yield operation
- Include any permits and amendments (as of 2023)
- Modify curtailment of Highland Lakes interruptible water as necessary to satisfy future LCRA Firm Municipal and Industrial Demands (Yes for Strategy Analysis, No for Supply Analysis)
- Set LCRA lower basin irrigation demands equal to projected future demands by decade (Yes for Strategy Analysis, No for Supply Analysis)

² Updating anticipated sedimentation rates does not require a hydrologic variance under 31 TAC § 357.10(14). The Technical Memorandum will require providing details regarding the sedimentation methodology utilized. Please consider providing that information with this request.

- Include LCRA Irrigation Return Flows to the Colorado River (Only when evaluating indirect use of these flows as a Strategy)
- Include Return Flows from Austin Wastewater Treatment Plants (Only when evaluating indirect use of these flows as a Strategy)
- Include Other Municipal and Industrial Return Flows (Only when evaluating indirect use of these flows as a Strategy)
- Include Reuse Provisions and Environmental Flow Requirements of LCRA-Austin 2007 Settlement Agreement (Only when evaluating indirect use of the applicable flows as a Strategy)
- Correct the DAT file WR records for Twin Buttes Reservoir to use control point C20330 instead of C20260
- Correct the DAT file CP record for C20260 to replicate evaporation data from C20240
- Correct the DAT file CP record for C20240 to read evaporation data from the EVA file for this control point.

These assumptions more accurately reflect the operation of supplies in Region K for supply and strategy evaluations and is therefore more conservative than Run 3.

9. Are you requesting to include return flows in the modeling? If yes, are you doing so to model an indirect reuse water management strategy (WMS)? Please provide complete details regarding the proposed methodology for determining reuse WMS availability.

Yes

Strategy Supply

Return flows are only considered when evaluating strategies.

10. Are any of the requested Hydrologic Variances also planned to be used by another region for the same basin? If yes, please indicate the other Region. Please indicate if unknown.

Yes

Many of these changes will be included in Region F.

11. Please describe any other variance requests not captured on this checklist or add any other information regarding the variance requests on this checklist.

[Click or tap here to enter text.](#)

Exhibit C

First Amended
General Guidelines for Development of the
2026 Regional Water Plans

October 2022

Excerpt Section: 2.7.2
Uncertainty and drought(s)
worse than drought of
record

This document is subject to future revision based upon any future Legislative actions.

2.7 Drought response information, activities, and recommendations (Task 7)

Links to rule and scope of work requirements:

- [§357.42: Drought Response Information, Activities, and Recommendations](#)
- [Scope of work Task 7: Drought Response Information, Activities, and Recommendations](#)

Guidance:

This chapter of the RWP must consolidate existing and/or new information on droughts of record and drought preparations in the region and present a variety of recommendations, if any, developed by the RWPG. The TWDB does not intend to develop a chapter template this cycle, since this is no longer a new chapter, however it is recommended that RWPGs follow the order of this guidance section when developing the drought chapter to ensure all requirements are met.

2.7.1 Drought(s) of record

The RWP must present and summarize information regarding the current drought(s) of record (DOR) for the region and any other relevant sub-regional or basin-specific drought of record periods that impact the existing RWPA water supplies. This summary may include relevant sub-regional, basin-based, and/or sub-basin droughts of record.

The RWP may present information supporting recognition of potential new droughts of record for the region or a sub-region and/or for individual river basins or groundwater resources that impact the RWPA water supplies.

2.7.2 Uncertainty and drought(s) worse than drought of record

RWPs must address water supply needs during a repeat of the drought of record. During plan development, the generated values of planning factors (supplies, demands, population) all have associated ranges of uncertainty. Although the limited regional planning resources may not support evaluating a range of or multiple scenarios and although assessments of the likelihood of droughts potentially worse than the drought of record are not required, RWPGs may choose to consider scenarios and/or qualitatively address uncertainty and DWDOR in their region. These scenarios or qualitative assessments can be used to more explicitly recognize or acknowledge the relative uncertainties in planning factors and the potential risks without necessarily modifying the plan to mitigate those risks.

The known but unquantified uncertainty associated with factors such as projecting population and water demands or hydrologic variability may be considered by RWPGs in the existing water planning framework by the following examples:

1. Utilizing conservative water source yields (e.g., one year safe-yield for planning purposes rather than a firm yield) or statistical assessments, including for evaluating expected near-term water supply based on recent starting reservoir conditions for the near-term decade (2030) water supply estimates

2. Utilizing a management supply (safety) factor of supply development in excess of projected needs. Safety factors have been used to hedge such uncertainties as
 - a. reduction of supply available from existing sources in case of a drought more severe than the previous drought of record,
 - b. unanticipated population or industrial growth⁵⁹ within the region,
 - c. delayed development of proposed management strategies,
 - d. loss of supplies due to problems with facilities or contamination of sources, or
 - e. other methods
3. Including information from water providers in the region that have developed long-range plans to assess their system's capacity under conditions worse than the drought of record, including any projected condition assumptions and expected impacts the utility determined through their studies
4. Quantifying the demand reductions achieved through implementation of drought contingency plans and, even if not a recommended strategy for the regions, presenting the information in the plan as specific measures to implement in the occurrence of a drought worse than the drought of record

Chapter 7 of the RWP must include a separate subsection addressing the following items regarding planning for uncertainty and droughts worse than drought of record (DWDOR):

1. Summarize, in general, how the region incorporated planning for uncertainty in its RWP and the region's basis, or policy, for inclusion. This could include general discussion on planning factors, any drivers of uncertainty associated with those factors, and how the RWPG made planning decisions to acknowledge or address that uncertainty. If the RWP does not include any measures to address uncertainty, this subsection must include a statement to that effect.
2. Summarize, in general, the key assumptions, analyses, strategies, and projects that are already included in the 2026 RWP calculations and recommendations (if applicable) that go beyond just meeting identified water needs anticipated under a DOR (i.e., those things that will provide some additional measure of protection to withstand a DWDOR such as use of safe-yield or inclusion of strategies that provide water volumes in excess of the identified water need, such as management supply factor, etc.). The summary should include describing which water users in the region, in general, are associated with those additional measures of protection (e.g., list of WUGs and WWPs and their associated water supplies to which these assumptions apply). If the RWP does not include any planning measures to address a DWDOR, this subsection must include a statement to that effect.
3. Summarize, in general, the potential additional types of measures and responses, that are not part of the recommendations in the 2026 RWP, but that would likely be available to certain water providers/users in the event of the near-term onset of a DWDOR and that would be capable of providing additional, potential capacity for those water providers and users to withstand a DWDOR (i.e., additional or deeper drought management measures - if not a recommended WMS - that could be employed). The summary should include describing which water providers/users in

⁵⁹ November 2014 Drought Preparedness Council recommendation to RWPGs

the region, in general, the additional measures and responses would be associated with (e.g., list of WUGs and WWP and their associated water supplies to which these assumptions apply). This information may be presented at a high-level as provided in the examples in the table template below. **The RWPGs are not expected to identify conditions that constitute a DWDOR or provide details on potential capacities that would be necessary to plan for a DWDOR.**

To supplement this subsection, regions may use the example template in the [2026 RWP Exhibit C Tables Excel file](#).

2.7.3 Description of current preparations for drought in the region including unnecessary or counterproductive drought response

The RWP must consolidate and present

1. a description of how water suppliers in the region identify and respond to drought conditions (this may include information from local drought contingency plans); and
2. a summary of drought response efforts that the region has identified as unnecessary or counterproductive.

For the identification of unnecessary or counterproductive drought response strategies, planning groups must review and summarize, at a minimum, efforts for neighboring communities that may confuse the public or impede drought response efforts. This includes for example, differences in the implementation of outdoor watering restrictions.

2.7.4 RWPA drought response triggers & actions

RWPGs must identify existing drought response triggers and actions for existing surface water and groundwater sources on which the region relies. This includes the identification of

1. factors (triggers) specific to each water source to be considered in determining whether to initiate a drought response, and
2. actions to be taken as part of the drought response by the manager (such as water providers, reservoir operators, groundwater conservation districts) of each water source and the entities (self-supplying entities, customers) such as relying on each source, including the number of drought stages.

This information may be based on the review of existing triggers and actions associated with existing Drought Contingency Plans.

If the RWPG is uncertain of the source manager or if there is none, the plan should indicate "NA." The RWPG should report, by source, the triggers that are available. If there are no triggers, the RWPG should report that information as "none." See the [2026 RWP Exhibit C Tables Excel file](#) for an example format.