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**Exhibit C**

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# **First Amended General Guidelines for Fifth Cycle of Regional Water Plan Development**

***November 2016***

***This document is tentative guidance pending approval of proposed revisions to 31 TAC 357.  
This document is subject to future revision based upon any future Legislative actions.***

Note that boxed text includes significant revisions or additions or reorganization of previous content. Of particular note is the addition of Section 3.6 in response to input received from technical stakeholders.

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assuming that all senior water rights will be totally utilized and all applicable permit conditions met.

15. Initially Prepared Plan (IPP) – The draft regional water plan that is presented at a public hearing in accordance with 31 TAC §357.21(d) (relating to Notice and Public Participation) and submitted for Board review and comment.
16. Interbasin Transfer of Surface Water – Defined and governed in the Texas Water Code §11.085 (relating to Interbasin Transfers) as the diverting of any state water from a river basin and transfer of that water to any other river basin.
17. Interregional Conflict – An interregional conflict exists when:
  - a. more than one regional water plan includes the same source of water supply for identified and quantified recommended water management strategies and there is insufficient water available to implement such water management strategies; or
  - b. in the instance of a recommended water management strategy proposed to be supplied from a different regional water planning area, the regional water planning group with the location of the strategy has studied the impacts of the recommended water management strategy on its economic, agricultural, and natural resources, and demonstrates to the Board that there is a potential for a substantial adverse effect on the region as a result of those impacts.
18. Intraregional Conflict – A conflict between two or more identified, quantified, and recommended water management strategies in the same initially prepared plan that rely upon the same water source, so that there is not sufficient water available to fully implement all water management strategies and thereby creating an over-allocation of that source.
19. Major Water Provider (MWP) – A water user group or a wholesale water provider of particular significance to the region's water supply as determined by the regional water planning group. This may include public or private entities that provide water for any water use category.
20. Modeled Available Groundwater (MAG) Peak Factor – A percentage (e.g. greater than 100 percent) that is applied to a modeled available groundwater value reflecting the annual groundwater availability that, for planning purposes, shall be considered temporarily available for pumping consistent with desired future conditions. The approval of a MAG Peak Factor is not intended as a limit to permits or as guaranteed approval or pre-approval of any future permit action.
21. Planning Decades – Temporal snapshots of conditions anticipated to occur and presented at even intervals over the planning horizon used to present simultaneous demands, supplies, needs, and strategy volume data. A water management strategy that is shown as initially providing a supply in the 2040 decade, for example, is assumed to come online in the year 2040.
22. Political Subdivision - City, county, district, or authority created under the Texas Constitution, Article III, §52, or Article XVI, §59, any other political subdivision of the state, any interstate compact commission to which the state is a party, and any nonprofit water supply corporation created and operating under the Texas Water Code Chapter 67 (relating to Nonprofit Water Supply or Sewer Service Corporations).
23. Regional Water Plan (RWP) – The plan adopted or amended by a regional water planning group pursuant to the Texas Water Code §16.053 (relating to Regional Water Plans) and 31 TAC Chapter 357.
24. Regional Water Planning Area (RWPA) – The area designated pursuant to the Texas Water Code §16.053.
25. Regional Water Planning Group (RWPG) – A group designated pursuant to the Texas Water Code §16.053.

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It should be noted that not all groundwater availability falls within MAG values.

### **3.5.1 Availability for Relevant Aquifers**

For RWPA's with at least one groundwater conservation district (GCD), MAGs shall be the basis for groundwater availability in all locations that have a DFC. Every available MAG must be used for all geographic areas in the RWPA regardless of whether there is a GCD in a particular location.

The MAG(s) for each relevant aquifer will be provided by TWDB through the DB22 interface, split into *discrete geographic-aquifer units* by: Aquifer/Region/County/ Basin.

The groundwater availability (and the associated existing and future groundwater supplies based on the availability) for any given discrete geographic-aquifer unit in the RWPA's shall not exceed the annual MAG volume as provided in DB22 unless authorized by the EA approval prior to the IPP through the hydrologic variance request process to apply a MAG peak factor. Any reallocation of annual MAG volumes between discrete geographic-aquifer units must be consistent with the relevant aquifer's MAG. See Section 3.6 for more information on the hydrologic variance process.

### **3.5.2 Availability for Non-relevant Aquifers and Local Groundwater Supply Areas**

As described above, most areas with groundwater availability volumes occur within a recognized major, minor, or other aquifer that have associated DFCs, and will therefore have an associated annual MAG volume. In limited locations, however, there will be some annual groundwater availability volumes that are **not associated with DFCs** as follows:

1. all or portions of a major or minor aquifer that were classified as non-relevant by GCD(s) in a GMA, and therefore do not have associated DFCs or MAGs;
2. any other aquifers or portions of aquifers that were not considered in the DFC process, but for which there are identified existing groundwater supplies; or
3. a local groundwater supply area usually not associated with a major, minor, or other aquifer (e.g., a small local alluvial aquifer) that may still be used as a non-municipal water supply source, but that the GMA determined to be not relevant to the DFC process.

For these groundwater sources where no DFC exists, RWPGs shall determine the groundwater availability, for planning purposes. These RWPG-estimated groundwater availabilities may be determined by using what is presented in the local GCD management plan. If no GCD exists, the RWPG may use TWDB GAM models, if available, or other means to develop estimates of groundwater availability (e.g., based on previous RWP estimates). RWPGs shall document and justify the method(s) used.

To assist RWPGs, all of the associated MAGs that only cover a portion of a discrete geographic-aquifer unit will be flagged in DB22. This means that the associated discrete geographic-aquifer unit may or may not have an additional RWPG-estimated groundwater availability associated with it.

### **3.5.3 Availability for an RWPG with no GCDs within its RWPA**

In accordance with 31 TAC §357.32(d)(2), an RWPG with no GCDs within its RWPA shall determine the *availability* of relevant aquifers for regional planning purposes. The Board shall review and consider approving this *RWPG-estimated groundwater availability* prior to inclusion in the IPP, including determining if the estimate is physically compatible with the DFCs for relevant aquifers in

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GCDs in the co-located GMA(s). The EA shall use the Board's GAMs as appropriate to conduct the compatibility review.<sup>13</sup>

### **3.5.4 Groundwater Availability and Related WMSs**

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 desired future conditions) 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 shall 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 solids (TDS) concentration between 1,000 and 10,000 milligrams per liter (mg/L).<sup>14</sup>

Below are examples of scenarios that would not be eligible to use as future groundwater management strategies:

- **Overallocation:**<sup>15</sup> TWDB staff 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 shall 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 3.6 for more information on the hydrologic variance process.
- **Permitting Uncertainty:** 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 groundwater availability and therefore could not all be permitted by a GCD, the affected RWPG(s) may not include these recommended WMSs simultaneously in the RWP(s).<sup>16</sup> See Section 3.6 for more information on the hydrologic variance process.

The Board received funding through HB 30 to delineate brackish groundwater production zones of four aquifers (Gulf Coast, Blaine, Rustler, and Carrizo-Wilcox), and studies were completed by the

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<sup>13</sup> Related to 84(R) SB 1101 requirements. As of October 2016 these requirements only apply to the North East Texas (Region D) RWPG, as it is the only region currently in the state with no GCDs in its RWPA.

<sup>14</sup> Related to 84(R), HB 30 requirements.

<sup>15</sup> The term *over allocation*, as used in the regional water planning process, is a planning term not a hydrologic term. It simply indicates that a project would rely on more groundwater than was designated as *available* for use by the RWPGs in the RWPs; in this case, more than the annual MAG volumes. Availability is subject to change.

<sup>16</sup>Applies both intra-regionally and inter-regionally.

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end of 2016. Additional aquifers will be added in subsequent years.<sup>17</sup> These other resources may be available to the RWPGs to assist in their consideration of developing brackish supplies.

The Technical Memorandum, IPP, and final adopted RWP shall include a written summary of all WAM and GAM models on which the surface and groundwater *availabilities* in the RWP are based (except for *availability* associated with MAGs). This summary must include:

1. the named/labeled version (including date) of each model used;
2. a summary of any modifications to each model and the date these modifications were approved by the EA;
3. the name of the entity/firm that performed each model run; and,
4. the date of each model run.<sup>18</sup>

For GAM input files developed in support of any non-MAG groundwater availabilities used in plan development, a pdf of supporting run information should be included that allows for an understanding of the basis for the GAM run and the ability to reproduce the groundwater availability results.

### **3.6 Hydrologic Variance Requests for Water Availability Determination**

As previously stated for water availability evaluations, as a default RWPGs shall use the unmodified TCEQ **WAM RUN#3** (plus anticipated sedimentation) to estimate reservoir firm yields and run of river firm diversions or MAGs for groundwater availabilities, in order to determine existing water supplies. If an RWPG would like to use an alternative methodology to evaluate water availability, the **RWPG may submit a written request to the EA** for a hydrologic variance to modify the default hydrologic assumptions. If the EA finds the hydrologic variance to be necessary and/or appropriate to more accurately reflect existing water supplies, the **EA will then provide written approval**.

In general, an RWPG hydrologic variance request must be submitted in writing to the EA and include<sup>19</sup>:

1. A description of the alternative availability assumptions being requested;
2. Documentation justifying the basis for the request;
3. How the modification will affect the associated annual availability volume(s) in the RWP; and,
4. The date the RWPG approved submittal of the request to the TWDB EA.

If approved by the EA in writing, the RWPG shall still present the unmodified firm yield and/or annual availability volume(s) in the hydrologic variance technical documentation in the IPP, the final adopted RWP, and DB22 as well the approved alternative availabilities.

While an EA authorization can be granted to use a requested alternative hydrologic modeling assumption(s) in order to evaluate availability for existing water supplies for development of an RWPG's 2021 RWP, **it is the responsibility of that RWPG to ensure** that the resulting estimates of

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<sup>17</sup> More information on HB 30 and other research projects in support of groundwater models can be found at <http://www.twdb.texas.gov/innovativewater/bracs/HB30.asp> and <http://www.twdb.texas.gov/groundwater/models/research/index.asp>

<sup>18</sup> All input files of WAM models used to develop the RWP shall be included as an electronic appendix per Section 12 of this guidance document.

<sup>19</sup> These steps are just a general outline - different types of hydrologic variance requests may require additional information, such as for a MAG Peak Factor, which is described in more detail in Section 3.6.1 of this guidance document.

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alternative water availability are reasonable for drought planning purposes and will reflect conditions expected in the event of near-term, actual drought conditions; and in all other regards will be evaluated in accordance with the contract guidance documents.

Below are types of potential alternative hydrologic assumptions for groundwater and surface water availability evaluations that would require written approval prior to the IPP from the EA through the hydrologic variance request process.

### **3.6.1 Potential Groundwater Hydrologic Variance Assumptions**

**MAG Reallocation:** A hydrologic variance request to shift portions of annual MAG volumes between discrete geographic-aquifer units shall be in writing from the RWPG and must be consistent with the relevant aquifer's MAG. This proposed hydrologic variance request must include a table with the proposed changes for each discrete geographic-aquifer unit, for each decade, along with an explanation of:

1. the basis for the reallocation request;
2. how DFCs at that location as well as the DFCs in any surrounding areas shall be achieved under the reallocation;
3. how the reallocation is consistent with the relevant MAG and GCD management plan(s); and,
4. the long-term impact that pumping based on the reallocation would have on the DFC at that location.

If approved by the EA, the reallocation of annual MAG volumes between discrete geographic-aquifer units shall be performed by TWDB staff only within DB22. Note that the unmodified, discrete geographic-aquifer annual MAG volume(s) shall also be reported in the hydrologic variance technical documentation.

**MAG Peak Factor:** With approval of the relevant GCD (where applicable) and GMA an RWPG may submit a written request for the use of a MAG peak factor to accommodate temporary increases in annual availability volumes, for planning purposes, above the MAG. The MAG peak factor is a percentage (e.g., greater than 100 percent) that is applied to an annual MAG volume reflecting a groundwater availability that, for planning purposes, shall be considered temporarily available for pumping consistent with a DFC(s). This is a regional water planning accommodation to reflect anticipated pumping fluctuations between wet and dry years or may account for other shifts in the timing of pumping while remaining consistent with DFCs while maintaining the integrity of the planning process. This proposed MAG peak factor request must include:

1. written approval by affected GCD(s), if one exists in the discrete geographic-aquifer unit, **and** from representatives of the applicable GMA;
2. provide the technical basis for the request; and,
3. document the basis for how the temporary increase will not prevent the GCD from managing groundwater resources to achieve DFCs.

The TWDB will review documentation provided by the GCD submitted in support of the proposal to implement a MAG Peak Factor. This review may, depending on the area to be affected by the MAG Peak Factor, involve evaluation of the relevant hydrostratigraphic and geologic features, groundwater levels and groundwater flow, groundwater pumping, spring flow, interaquifer flow, and discharge to surface waters. Districts will need to provide adjusted model well files or detailed georeferenced maps of pumping assumptions (pumping location, pumping amounts, and model layer) to support the TWDB's evaluation. The effect of the MAG Peak Factor on the adjacent or

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hydrologically connected groundwater resources outside of the district will be evaluated to understand the possible effect of the MAG Peak Factor on the ability of neighboring districts to achieve their relevant desired future conditions. This evaluation may include reviewing existing GAM runs and/or performing additional modeling runs, as required.

If approved by the EA, the MAG Peak Factor would be applied by TWDB staff only to the associated annual MAG volume in DB22 to calculate the modified groundwater availability volume that would be used by an RWPG in order to determine existing supplies and future water management strategies. Note that the unmodified, discrete geographic-aquifer annual MAG volume(s) shall also be reported in the MAG peak factor request technical documentation.

### **3.6.2 Potential Surface Water Hydrologic Variance Assumptions**

For surface water availability and supply analyses, RWPGs shall use the most current Water Availability Models from TCEQ. RWPGs may use better, more representative water availability modeling assumptions or better site-specific information with written approval from the EA. RWPGs should always consider requesting a hydrologic variance for a hydrologic assumption modification for any issue that is expected to have a significant effect on determining an existing supply.

Model modification assumptions and unmodified firm diversion and/or firm yields shall be submitted in the hydrovariance request documentation, included in the appropriate methodological sections of the IPP and final adopted RWP, and all model files shall be included as pdf documents in the IPP and final adopted RWP documentation submitted.

Under **NO** circumstances will a hydrologic variance be allowed that would assume unreliable supplies would be available under DOR conditions including those that assume:

1. that the reliable supply from an ROR diversion (firm diversion) could use the 75/75 rule, i.e., 75% of the water available in 75% of the time for irrigation water rights; and
2. that a **single-source municipal** reliable supply from an ROR diversion (firm diversion) is equal to the minimal annual diversion.

From past plans, potentially appropriate surface water modeling assumptions for RWP development include:

1. **Addition of Return Flows:** This is a WAM modification to include a certain level of return flows that are reasonably expected to be available under drought of record conditions from specific entities/locations in the model in order to evaluate existing supplies (current WAM RUN#3 models contain no return flows). Planning groups should give consideration to the RWPA's projection "dry year" (i.e., reflecting return flows from the same year as that of the demand projection dry year).

2. **Reservoir Operational Yield:** This is a WAM modification to decrease the effective drought of record firm yield of the reservoir due to, for example, the actual location of a user's intake; the smaller firm yield would allow that user to maintain its inflow diversion. A past example is an approximate 50% decrease in firm yield to maintain the flow from a small lake through the adjacent fish hatchery.

3. **Extended Hydrology for Revised Reservoir Inflows (and Potential Recognition of New Drought of Record):** This is a WAM firm yield modification to include extended hydrology,