

APPENDIX W

RESPONSE TO COMMENTS ON INITIALLY PREPARED PLAN

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This appendix includes responses to comments on the *Initially Prepared 2016 Region C Water Plan* (IPP) that were received by the Region C Water Planning Group (RCWPG). Comments from state agencies (Texas Water Development Board and Texas Parks and Wildlife Department) are presented in full at the beginning of the appendix. The remainder of the appendix includes responses to specific written comments and responses to the general comments that were received both in written form and from oral comments provided at the June 24, 2015 Region C Water Planning Group Public Hearing on the Initially Prepared Plan. The full version of all comments and a full transcript of the comments from the public meeting may be found in Appendix V.

TWDB Comments on Initially Prepared 2016 Region C Regional Water Plan with Responses

Level 1: Comments and questions must be satisfactorily addressed in order to meet statutory, agency rule, and/or contract requirements.

1. Please consider including a general statement clarifying whether or not the planning group met all requirements under the Texas Open Meetings Act in the final, adopted regional water plan. *[31 Texas Administrative Code (TAC) §357.21 and §357.50(d)]*

These requirements were met. A statement was added in Chapter 10 (page 10.7) saying that they were met.

2. Please describe how publicly available plans for major agricultural, municipal, manufacturing and commercial water users were considered in the final, adopted regional water plan. *[31 TAC §357.22(a)(4)]*

Region C consulted published plans for major municipal water providers (TRWD IWSP, NTWMD, DWU Long Range Plan, etc) and met with all major WWP's to gather input. A paragraph was added to the top of page 5C.2 describing how these plans were consulted.

Region C also sent surveys to all WUGs and WWP's not met with asking for future plans. There is no major agriculture use in region and no published agricultural water plans. Manufacturing and commercial uses are covered under most WWP's plans. A paragraph was added to the top of page 5D.1 describing how these plans were consulted.

3. Chapter 2: Please include a summary of the the municipal demand savings due to plumbing fixture requirements (as previously provided by TWDB) in the final, adopted regional water plan. *[31 TAC §357.31(d)]*

This information was already in Table 5E.9 of the IPP as a total for the Region. A new paragraph has been added to Chapter 2 (pages 2.6 and 2.7) to further describe these savings. This new paragraph references a new table at the end of Appendix E which presents these savings by WUG/county.

4. Please provide a statement regarding any water availability requirements promulgated by a county commissioners court pursuant to Texas Water Code (TWC) §35.019, which in Region C applies to the North-Central Texas Trinity and Woodbine Aquifers Priority Groundwater Management Areas. *[31 TAC §357.22(a)(6)]*

To our knowledge, no Region C county commissioners court has promulgated any water availability requirements. We added a paragraph on page 1.15 stating this. We also added a new Figure 1.3 showing the Priority Groundwater Management Areas in Texas.

5. The plan does not appear to include a listing of the water rights that are the basis for the surface water availability in the plan. Please include such a listing in the final, adopted regional water plan. *[Contract Exhibit 'C', Section 3.1]*

Water rights were included in Table 1.5 (Chapter 1) of the IPP. They have been added to Table I.3 (Appendix I).

6. The plan does not appear to tabulate the local supplies used in the plan along with an explanation of the basis of the associated local supply water volumes. Please include the required information on local supplies in the final, adopted regional water plan. *[Contract Exhibit 'C', Section 3.3]*

This information is presented in detail in Appendix I (page I.22 text and Table I.6); along with a statement in Chapter 3 referring the reader to Appendix I. The text on page I.22 was clarified and expanded.

7. Please clarify how the run-of-river availabilities were calculated for municipal water users to ensure that all monthly demands are fully met for the entire simulation of the unmodified Texas Commission on Environmental Quality Water Availability Model run 3 in the final, adopted regional water plan. *[Contract Exhibit 'C', Section 3.4]*

We clarified the statement in Appendix I and Chapter 3 that run-of-river diversions were calculated using minimum monthly diversions.

8. The plan does not appear to include documentation of the public process for identifying potentially feasible water management strategies. Please include this documentation in the final, adopted regional water plan. *[31 TAC §357.12(b)]*

We included the following documentation of the public process on page 5A.1:

As part of Task 4B (Potentially Feasible Water Management Strategies), Region C produced a memorandum to TWDB dated November 10, 2011 with Subject "Methodology for Evaluating Water Management Strategies for the 2016 Region C Water Plan." The RCWPG approved the methodology laid out in this memo at the October 25, 2011 RCWPG public meeting (Agenda Item III.B.). Region C consultants later presented the RCWPG with a full list of Potentially Feasible Water Management Strategies at the January 26, 2015 RCWPG public meeting (Agenda Item IV.F.). RCPWG approved the potentially feasible and recommended WMSs as part of the Initially Prepared Plan at the April 20, 2015 RCWPG public meeting (Agenda Item IV.A.).

9. Page 3.2, Table 3.1: Please include a description of the basis for the estimated increase in reuse availability between 2020 and 2070. *[31 TAC §357.32(a)(1)]*

Additional information on the mechanics of how reuse availability increases over time was added to Chapter 3.

10. Page 5B.5, Table 5B.2; Appendix P: The plan in some instances, does not appear to include a quantitative reporting of environmental factors. For example, the summary table 5B.2 for water management strategy evaluations in Appendix P appears to present qualitative scores (e.g., "medium") but it is unclear if the scores are based upon quantitative data. Please include quantitative reporting in the final, adopted regional water plan. *[31 TAC §357.34(d)(3)(B)]*

A quantitative rating system was developed and added to Appendix P (scale of 0-5, with each number from 0 to 5 representing a quantified impact). In Table 5B.2 (Now Table 5B.1) the reader is referred to Appendix P for information on the quantitative data used to develop the qualitative scores using in Table 5B.1.

11. Page 5B.5, Table 5B.2; Appendix P: The plan in some instances, does not appear to include a quantitative reporting of impacts to agricultural resources. For example, the summary table 5B.2 for water management strategy evaluations in Appendix P appear to present qualitative (e.g., “medium”) scores but it is unclear if the scores are based upon quantitative data. Please include quantitative reporting in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(C)]

A quantitative rating system was developed and added to Appendix P (scale of 0-5, with each number from 0 to 5 representing a quantified impact). In Table 5B.2 (Now Table 5B.1) the reader is referred to Appendix P for information on the quantitative data used to develop the qualitative scores using in Table 5B.1.

12. Pages 5B.10, 11.16, and P.57: The plan appears to incorporate by reference Marvin Nichols strategy evaluation material from the 2011 Region C Regional Water Plan. For example, page P.57 states that “Region C is retaining the original configuration of Marvin Nichols Reservoir (at elevation 328 msl, as detailed in the 2011 Region C Water Plan) as an alternative water management strategy for the 2016 Region C Water Plan.” Please include the relevant additional strategy information for that alternative strategy in the final, adopted regional water plan. [31 TAC §357.34(e)]

Pages 5B.10, 11.16, and P.57 have been clarified to differentiate the two configurations of Marvin Nichols reservoir presented in this plan, as either the recommended (elevation 313.5 msl) strategy (as part of the Sulpur Basin Supplies) or the alternative strategy (elevation 328 msl). For the Marvin Nichols (328 msl) configuration that is the alternative strategy, the reader is referred to Appendix P of the 2016 Plan rather than referencing the 2011 Plan. An introduction has been added to Appendix Y to clarify which quantitative report is associated with the each configuration of the Marvin Nichols reservoir.

13. Page 5C.10; Appendix P, Pages P.8 and P.62: In some instances, the plan appears to present incomplete water management strategy evaluations. For example, the George Parkhouse Lake (South) strategy and the Neches River Run-of-River strategy configurations. The Neches Run-of-River strategy states the preferred project “would include run-of-river diversion ...operated conjunctively with tributary storage, groundwater, and/or system operations with Lake Palestine...”, however it is not clear that the strategy evaluation for the conjunctive components of the project are included. Please clarify strategy labels or include the full strategy evaluations for all alternative and recommended strategies in the final, adopted regional water plan. [31 TAC §357.35(g)(3)]

Text was removed from the Appendix P write-ups and Page 5C.10 to help clarify the recommended Neches ROR strategy. Text was added to the Appendix P write-up for several “incomplete” strategy recommendations.

14. Pages 5D.285 and 5D.288: The plan does not appear to consider conservation as a potentially feasible strategy for all identified water supply needs. For example, there does not appear to be an explanation for why Navarro County Manufacturing and Steam Electric Power Water User Groups (WUGs) do not have conservation strategies. Please include documentation that conservation was considered to meet identified needs and, if not recommended, please document reason in the final, adopted regional water plan. [31 TAC §357.34(c)(3), §357.34(f)(2)(B)]

Chapter 5D has been modified for steam electric WUGS with needs to reflect that “Conservation was a considered strategy for this water user group, but not recommended because the steam electric demand projections themselves considered items such as future efficiency programs.”

Chapter 5D has been modified for any manufacturing WUGS with needs but no conservation strategy to reflect that “Conservation was a considered strategy for this water user group, but not recommended because of the uncertainty in the ability to implement conservation measures given the multiple entities, facilities, and various manufacturing processes that make up this WUG.”

Chapter 5D has been modified for any mining WUGS with needs but no conservation strategy to reflect that “Conservation was a considered strategy for this water user group, but not recommended because of the uncertainty in the ability to implement conservation measures given the multiple companies, industries, facilities, and types of processes that make up this WUG.”

Chapter 5D has been modified for any Cooke County Irrigation to reflect that “Conservation was a considered strategy for this water user group, but not recommended because of the uncertainty in the ability to implement conservation measures given the multiple entities, location, and types of irrigation that make up this WUG.”

15. Pages 5E.30 and 5E.31; Appendices P and Q: Some conservation water management strategies for municipal, manufacturing, and mining WUGs appear to be combined with reuse strategies. For example, the components listed on page 5E.30 for the ‘Expanded Water Conservation Package’ WMS include “reuse of treated wastewater effluent.” Unless the projects are directly interdependent, and reflected as such in the regional water planning database, each strategy type must be associated with separate volumes of water provided and should not be lumped together with other types of strategies. Strategy types must remain independent of one another to reflect implementation and to facilitate project prioritizations for funding. Please modify as appropriate throughout the final, adopted regional water plan and in the regional water planning database. *[31 TAC §357.34(e); Contract Exhibit ‘D’, Section 5.3]*

The State’s definition of conservation includes reuse (Texas Water Code §11.002(8)), (See Section 5E.2, page 5E.2). For that reason, Region C chose to discuss conservation and reuse in the same Chapter (5E). However, no reuse WMSs were combined with conservation WMSs in this plan. The 6th bullet item at top of Page 5E.30 has been eliminated so that it is clear that all conservation strategies have been kept separate from any reuse strategies in this plan. To avoid confusion, Appendix K has been edited to eliminate reference to Reuse.

16. Chapter 5: Please confirm that the calculated firm yields are based upon water available during the drought of record for the strategies utilizing sources from Lake Hugo, Lake Palestine, Lake Ralph Hall and Reuse, Lake Texoma, Lower Bois d'Arc Reservoir, Neches River Run-of-River, and Toledo Bend Reservoir. Please clarify in the final, adopted regional water plan. *[Contract Exhibit ‘C’, Section 3.4]*

A statement was added on page 5B.1 confirming use of WAM 3 to calculate reservoir yields and run-of-river supplies. For Oklahoma supply, so there is no WAM, so standard hydrologic practices were used.

17. Chapter 7: The plan does not appear to provide a general description of the local drought contingency plans that involve making emergency connections between water systems or wholesale systems. Please include these descriptions of local drought contingency plans, if any, in the final, adopted regional water plan or, if no local drought contingency plans involve making emergency connections, please indicate so in the final, adopted regional water plan. *[31 TAC §357.42(e)]*

A paragraph was added to the end of Section 7.3 (Existing and Potential Emergency Interconnects) that lists the non-confidential emergency interconnects (existing or potential) that were found during Region C's review of the Drought Contingency Plans submitted to Region C.

18. Please clarify whether the plan development was guided by the principal that the designated water quality and related water uses as shown in the state water quality management plan shall be improved or maintained. [31 TAC §358.3(19); Contract Exhibit 'C', Section 3.3].

A summary statement was added to the end of Section 6.1 (page 6.8) verifying that the strategies in the plan were developed based on the principle that designated water quality and related water uses as shown in the state water quality management plan shall be improved or maintained.

19. Appendix K; Appendix Q, Tables Q-10 and Q-11: Please clarify the water savings volumes associated with recommended conservation strategies that have capital costs. Please include this information in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(A) and (e); Contract Exhibit 'D', Section 5.4]

Information on conservation strategies has been entered into DB17 such that water savings volumes associated with capital costs have been entered separately from those savings not associated with capital costs. For this reason, Region C will incorporate tables generated from DB17 output in place of the current Tables Q-10 and Q-11.

20. Appendix P, Page P.1: As noted in the plan, the plan does not appear to include a strategy evaluation for the "Reuse-General" strategy referenced in the plan on page P.1. Please include this information in the final, adopted regional water plan. [31 TAC §357.34(d) and (e)]

This was prepared and submitted to TWDB on 8/26/15. Subsequently, TWDB provided the following comments to be addressed.

- a. Clarify why several reuse projects with identified firm yields do not have associated capital costs. **Added explanation for 5 projects with no capital costs.**
 - b. Identify recipient(s) for each reuse project listed. **Added recipient to table.**
 - c. Provide all unit costs in \$/acre-foot. **Changed costs from \$/thousand gallons to \$/acre-foot.**
 - d. Unless they are a single project, separate TRA/FTW Alliance Direct Reuse projects in order to cost out separate projects appropriately (refer to footnote **). **Added text to footnote.**
 - e. Suggest to clarify in footnote (a), the definitions of county for direct and indirect reuse, where 'county' for direct reuse project is where treatment plant is located; and for indirect reuse, is where receiving water body diversion point is located (including for reservoirs). **Comment noted, no change made. See DB17 for county.**
 - f. Suggest using same nomenclature for naming reuse sources and projects as was used in DB17. **Comment noted, no change made. DB17 nomenclature for reuse sources was revised without Region C input. Information in paper plan better reflects actual source description.**
 - g. Suggest providing the few missing DB17 SourceID numbers and ProjectID (or WMS_ID) numbers for reuse projects listed in the table once DB17 data entry has been finalized. **Added missing DB17 SourceID numbers.**
21. Appendix P, Page P.61: The plan does not clearly state whether the Neches River Run-of-River water management strategy evaluation incorporated environmental flow requirements. Please clarify whether analyses considered environmental flow requirements in the final, adopted regional water plan. If environmental flow requirements were not considered, please present results with

environmental flow requirement considerations in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(B)]

Text was added to Appendix P clarifying that the operation of this strategy will comply with TCEQ environmental flow standards.

22. Appendix P: The plan does not appear to include strategy evaluations for the following potentially feasible strategies as described in the contract scope of work: "Lake Livingston," "Tawakoni Pipeline," "DWU Southside (Lake Ray Hubbard) Reuse," and "DWU Lake Lewisville Reuse." Please include these strategy evaluations or explain why this contract scope of work item was not included in the final, adopted regional water plan. [Contract Scope of Work, Task 4D Subtask 2A]

After final scope of work was negotiated, these strategies were either 1) far enough along that they were now considered "existing" (Tawakoni Pipeline) and didn't need to be evaluated, or 2) were replaced by other strategies for consideration (these other strategies were evaluated in place of the ones listed in the contract).

23. The technical evaluations of the water management strategies do not appear to estimate anticipated water losses of the associated strategies. Please include an estimate of water losses in the final, adopted regional water plan, for example in a format of an estimated percent loss. [31 TAC §357.34(d)(3)(A); Contract Exhibit 'C', Section 5.1.1]

Per capita WUG demands, as presented in the plan, include associated losses between the water supplier and the end-user. Therefore, any project recommended to meet these demands, by default, account for these losses. It is assumed that future losses will be comparable and can be treated in a similar manner.

Water suppliers that are WWPs only that have large scale transmission systems are treated somewhat differently. Additional demand for losses in treatment and delivery has been explicitly added for North Texas Municipal Water District and Upper Trinity Regional Water District (See Tables H.23 and H.32). Coverage of losses for the remaining WWP-only with large scale transmission (Tarrant Regional Water District) was accounted for by using safe yield rather than firm. For these reasons, the RCWPG sees additional consideration of loss as unnecessary and redundant.

24. Appendix Q, Page Q.10: The cost estimate for "New Groundwater Wells" states that costs do not include engineering or land costs. Please ensure that all cost estimates include required costing elements in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(A); Contract Exhibit 'C', Sections 5.1.2 and 5.1.2.1]

Clarifying text was added to Appendix Q regarding engineering and land costs. Engineering was included for the cost estimates, but land costs were not included for new groundwater wells under the assumption that the new wells would be constructed on property already owned by the WUG. All of the WUGs with cost estimates for new wells already have existing wells.

25. Appendix Q, Page Q.22, Table Q-10: The plan does not appear to present a supply volume associated with the Oakwood WUG's Municipal Water Conservation water management strategy. Please present the associated supply volume for this strategy in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(A), Contract Exhibit 'C', Sections 5.1.2 and 5.1.2.1]

Oakwood is a shared WUG with Region H, with a population of less than 50 located within Region C. It was pre-determined that Region H would develop all WMS for this WUG. Comment noted, no change.

26. Appendix Q, Tables Q-12 and Q-13: The plan does not appear to present unit costs of municipal water savings in the dollars per acre-foot format as required. Please present information in the dollars per acre-foot format in the final, adopted regional water plan. *[Contract Exhibit 'C', Section 5.1.2]*

Costs shown in Tables Q-12 & Q-13 were in dollars per thousand gallons. They have been changed to dollars per acre-foot.

27. Appendix Q, Page Q.68, Table Q-39: The capital and annual costs for the Lake Columbia water management strategy in Table Q-39 (\$241,149,000 and \$53,284,000) do not appear to match the Lake Columbia costs presented in Appendix L, page 7.7-6 (\$288,640,000 and \$32,549,000). Please reconcile as appropriate in the final, adopted regional water plan. *[31 TAC §357.34(d)(3)(A)]*

The costs developed for Q-39 differ from those developed for the Dallas Long Range Plan (App L) because the Region C cost of the reservoir is from a detailed cost estimate prepared for ANRA whereas, the Dallas Long Range Plan cost is from the 2011 Region I Water Plan. A footnote was added to Q-39.

28. Appendix Q, Tables Q-67 and Q-74: It appears that, in some instances, cost estimates may include retail distribution infrastructure including for the Fort Worth Direct Reuse and Frisco Direct Reuse strategies. Please remove any costs associated with retail distribution from the final, adopted regional water plan. *[31 TAC §357.34(d)(3)(A), §357.34(e); Contract Exhibit 'C', Section 5.1.2.3]*

The majority of the cost for direct reuse projects is delivering the water from the WWTP to end users, so this is not considered retail distribution – it is a system to deliver water to major irrigation and industrial candidates. There is no supply available to anyone without these essential elements. These are not projects where water can put into the existing retail distribution system. Leaving these elements out of the projects would make these projects unworkable. Comment noted, no change.

29. Appendix Q, Table Q-46: The cost estimate includes a negative value representing an "avoided cost." Please remove cost elements that are not directly part of the required planning cost elements for the Lake Texoma desalination plant project in the final, adopted regional water plan. *[Contract Exhibit 'C', Section 5.1.2]*

The negative value representing an "avoided cost" has been removed from Table Q-46 in Appendix Q.

30. Appendix Q, Tables Q-18, Q-23, and Q-39: The plan in some instances, does not appear to present, separately, the estimated land purchase costs for reservoir footprint and mitigation land areas. For example, the Sulphur Basin Supply Strategy, Lower Bois d'Arc Creek Reservoir Strategy, and Lake Columbia Strategies do not separately present the estimated cost of conservation pool or mitigation land acreage. Please include land areas and estimated costs, separately, in the final, adopted regional water plan. *[Contract Exhibit 'C', Section 5.1.2]*

Note: Region C's interpretation of Contract Exhibit 'C', Section 5.1.2 is that a line item for the land acquisition associated with the reservoir should be included, but the land acquisition for mitigation can be included as one line item with mitigation.

Tables Q-16, Q-17, Q-18: The text of line items were edited to clarify each type of land cost.

Table Q-23: The land cost for the reservoir is on the first page of Table Q-23 under the headings of “Dam & Reservoir, Land and Surveying”; the land cost for mitigation is on the second page of Table Q-23 under the headings of “Permitting and Mitigation of reservoir and terminal storage, Land and Easement”; no change needed.

Table Q-32, Q-32A, Q-33, Q-33A, Q-39, Q-50, and Q-52: Cost estimate includes a line item for land acquisition for the reservoir and a line item for mitigation (which includes land acquisition); no change needed.

31. Appendix Q, Table Q.54: The project components and costs include \$600,000 for "equipment/vehicle storage" and \$4,250,000 for "foundation improvements." Water management strategy components included in regional water plans must be limited to the infrastructure required to develop and convey increased water supplies from sources and to treat the water for end user requirements. Please remove these and other costs that are not associated with providing additional supplies to WUGs from the final, adopted regional water plan. [TAC §357.34(d)(3)(A); Contract Exhibit 'C', Section 5.1.2 and Section 5.1.2.3]

This cost estimate (Q-54) is for Upper Trinity Regional Water District’s Water Capital Improvement Plan (CIP). All of these components are necessary in order for UTRWD to be able to develop, treat, and convey increased water supplies from sources to treated water customers. Costs for a number of line items that are not allowable under the TWDB Exhibit C guidelines have removed.

Level 2: Comments and suggestions for consideration that may improve the readability and overall understanding of the regional water plan.
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1. Section 3.3, Page 3.9; Appendix I, Page I.16: Please consider providing a complete description of the groundwater availability methodology employed for non-relevant portions of the Nacatoch Aquifer and "Other" aquifer groundwater sources in the final, adopted regional water plan.

MAG values were used for Nacatoch Aquifer supplies. Regarding “Other” aquifer supplies, the text explains the values are based on historical pumping data from the TRWD. No additional explanation was added to the text.

2. Page 3.11, Table 3.5: Please consider including a line item for the non-relevant portion of the Nacatoch Aquifer in Henderson County in the final, adopted regional water plan.

Region C did not show any supply from non-relevant portions of the Nacatoch Aquifer in Henderston County. MAG values were used for Nacatoch Aquifier supplies.

3. Page 5E.49, Item (3): Please consider correcting the URL reference to:

<http://www.texas.gov/conservation/doc/SB181Guidance.pdf> in the final, adopted regional water plan.

Corrected the URL reference.

Texas Parks & Wildlife Summarized Comments on 2016 Initially Prepared Region C Water Plan with Responses

1. Few details given in Chapter 1 on how threats to natural resources will be addressed.
 - a. In Chapter 1 (Section 1.12), it would be appropriate to reference Chapter 6 (Section 6.4.1). This section provides some descriptions of ways in which threats can be minimized, including water conservation, reuse, full utilization of surface supplies, and federal and state permitting requirements.
 - b. Section 1.10.3 (page 1.35), Table 1.14 (pages 1.36-1.37), and Table 2 in Appendix I (pages 4-7) provide information related to threatened and endangered species. Recent updates have been made to the TPWD County Lists of Protected Species and Species of Greatest Conservation Need (SGCN).
 - i. The Smalleye Shiner and Sharpnose Shiner are now listed as Federally Endangered species and should be included in the table.
 - ii. The Texas Pigtoe, Texas Heelsplitter, Texas Fawnsfoot, Louisiana Pigtoe, Southern Hickorynut, and Sandbank Pocketbook are now State Threatened and should be included in the table.
 - iii. The Fawnsfoot, Wabash Pigtoe, Common Pimpleback, Little Spectaclecase, Wartyback, and White Heelsplitter are no longer considered SGCN and can be taken off the tables.

Response 1:

Edited Section 1.12 to add reference to Section 6.4. Edited Tables 1.13 and 1.14 Threatened and Endangered Species listings to reflect specific changes in item 1.b. above.

Regarding the "Table 2 in Appendix I (pages 4-7)": the Appendix I that TPWD is referring to is a portion of a report on Quantitative Impacts of Marvin Nichols that was contained in Appendix Y of the IPP. Since this report has been previously finalized and was only included as a reference document to the IPP, no updates will be made to this section.

2. Adopted Desired Future Conditions (DFCs) for the primary aquifer in Region C, the Trinity Aquifer, do not address protection of springs or groundwater surface water interaction. Ultimately TPWD would like to see DFCs adopted to protect these features.

Response 2:

Regional Water Planning Groups do not have input in the Groundwater Management Area and Groundwater Conservation District process of selecting Desired Future Conditions, but encourages those entities to consider this comment when setting DFCs. No change made in the report.

3. TPWD recognizes the concerted effort to include more available quantitative environmental impact information in the 2016 IPP and encourages Region C to continue to improve this quantitative reports as information is available. Some suggested additions are:
 - a. Please attempt to include estimates on linear stream distances impacted or inundated.
 - b. Environmental flow impact data, including changes in downstream mean annual flow and changes in monthly or seasonal flows, is available for Lower Bois d'Arc Creek Reservoir WMS.
 - c. Appendix P (page P.34) appears to be missing a table under WMS Evaluation for Lake Columbia.

- d. Appendices G, H, and I include interim environmental assessment information related to the Sulphur Basin Supplies WMS but the quantitative impact analysis on natural resources is not yet available to review.
- e. TPWD encourages enhanced coordination regarding proposed reservoir project and the Sulphur Basin Supplies WMS in an effort to avoid, minimize, and mitigate impacts to fish and wildlife resources, including the White Oak Creek Wildlife Management Area. Attachment A provided by TPWD summarizes information regarding potential impacts of raising the elevation of Wright Patman Lake.

Response 3:

- a. Region C will strive to add more quantitative information in the next regional plan, including linear stream distances. No change made to the report.
 - b. While the streamflow information suggested in TPWD's comment has been calculated by others as part of on-going permitting activities, a decision was made not to include this information in the regional plan because this level of detail is not required for other strategies. In addition, this data could be subject to change during the permitting process.
 - c. Appendix P has been restructured so that quantitative data on each strategy has been included in Tables P.3 and P.4 rather than on the evaluation write-ups. Lake Columbia information is included in Tables P.3 and P.4.
 - d. Quantitative Marvin Nichols 313.5 report published shortly after TPWD comment letter received, so it is now available for their review. No further action needed.
 - e. Quantitative information for Wright Patman has now been included in Tables P.3 and P.4 as part of the Sulphur Basin Supplies Strategy.
4. Appendix I of IPP includes information regarding threatened and endangered species that might be impacted by the Sulphur Basin Supplies WMS. TPWD lists several species they feel should be part of this list and give web reference for further information.

Response 4:

In this comment, the Appendix I that TPWD is referring to is a portion of a report on Quantitative Impacts of Marvin Nichols that was contained in Appendix Y of the IPP. Since this report has been previously finalized and was only included as a reference document to the IPP, no updates will be made to this section.

5. TPWD commends Region C in the reduction in overall gpcd from 200 to 165 from the 2011 Plan to the 2016 IPP. TPWD encourages further progress towards meeting the statewide goal of 140 gpcd.

Response 5:

Region C appreciates TPWD's recognition of conservation efforts. Region C will continue to encourage additional conservation efforts. No change needed in the report.

6. Section 1.11.3 describes invasive species. Please include updated information to help clarify the present state of zebra mussels in Texas. The present known distribution (as of July 27, 2015) of zebra mussels in Texas reservoirs is: Texoma, Ray Roberts, Lewisville, Bridgeport, Lavon, Waco, and Belton. Zebra mussels have also been found on isolated occasions in the Red River below Texoma, the Elm Fork of the Trinity River below Lake Ray Roberts, Sister Grove Creek above Lake Lavon, and a boat with zebra mussels attached was found in Lake Ray Hubbard. To prevent the transmission of invasive species TPWD recommends avoiding transport of water from basins where these species are known to occur. If this is unavoidable these transfers of water should be directly to water treatment plants.

Response 6:

Section 1.11.3 has been modified with updated locations of known Zebra Mussels as of July 27 per TPWD list. The following statement was added: “To avoid further spread of this invasive species, strategies in this plan that involve transfer of water from basins or reservoirs with known presence of zebra mussels have been modified to transfer water directly to water treatment plants.”

Responses to Public Comments

The Region C Water Planning Group appreciates each comment it received from the public regarding the Initially Prepared Plan and appreciates those individuals and organizations who took the time to thoughtfully consider the plan and to present ideas to improve upon the plan.

- Oran Caudle
 - We thank Mr. Caudle for his report and comments on the IPP and his innovative ideas for securing the future water supply of Texas. Mr. Caudle’s comments focused on two key aspects of the plan: 1) proposal of five new water management strategies, and 2) issues with the Marvin Nichols cost estimate. We appreciate the opportunity to address both concerns. Below we outline some key reasons the five proposed strategies are infeasible or are less feasible than the strategies already included in the Region C Plan, as well as our response to the cost estimate issues.
 - *Patman/Chapman system of Reservoirs Option A. **Response:*** In this strategy, Lake Wright Patman is reallocated to 231 ft-msl, two 124-inch pipelines connect Lake Wright Patman to Lake Chapman, two 124-inch pipelines connect Lake Chapman to Lake Lavon, two 102-inch pipelines connect Lake Lavon to Lake Lewisville, and finally a 96-inch pipeline connects Lake Lewisville to Eagle Mountain Lake. As part of this strategy, Mr. Caudle proposes creating a run-of-river system for the following lakes: Lavon, Hubbard, Lewisville, Eagle Mountain, and Worth. With the exception of Lake Wright Patman, the lakes involved in this strategy, including the run-of-river ones, are fully allocated so they would not contribute additional yield to the strategy. Therefore the yield for this strategy comes entirely from Lake Wright Patman. Mr. Caudle states that “a Lake Patman elevation of 231 feet will produce the additional yield needed to protect the current senior water rights of the City of Texarkana, while providing 620,000 acre-feet for Region C.” However, according to the Sulphur River Basin Feasibility Study Summary Narrative (Dec 2014), the stand-alone priority-based firm yield of Lake Patman at 232.5 ft-msl is 461,000 ac-ft/yr based on TCEQ’s Sulphur WAM model without the proposed Marvin Nichols reservoir upstream. Of this total, 180,000 ac-ft/yr is already allocated to Texarkana, leaving 281,000 ac-ft/yr of new supply. (It should be noted that if the proposed Marvin Nichols reservoir is upstream, the incremental yield gained by raising Wright Patman is less than the 281,000 ac-ft/yr cited here. See Sulphur Basin Supplies strategy in this plan.) The yield at 231 ft-msl would be less than this. Therefore, the

proposed strategy relying on the supply from Wright Patman reallocation alone cannot meet the required demand in Region C.

- *Patman/Chapman system of Reservoirs Option A.* **Response:** Option B is similar to Option A but includes connections to two additional lakes: Lake Ray Roberts and Lake Bridgeport. Like the lakes discussed in Option A, these two lakes are also fully allocated. So again the entire yield of the project would come from Lake Wright Patman, which alone does not have sufficient yield to meet the needs of Region C.
- *The Northeast Texas Canal (NTC).* **Response:** Mr. Caudle identified multiple important benefits of canals, including an asserted lower cost per mile to build and lower electricity usage. In Texas, large canals have proved economical on the flat coastal plains. In other part of the state with greater variations in elevation, canals have not proved to be as cost effective as pipelines and have not been implemented. We believe that the general assumption that pipelines will prove to be the preferred method of transport for Region C is correct. In general compared to pipelines, canals have much higher evaporative losses and other carriage losses (e.g. leakage, theft), canal siting is more sensitive to surface elevations, crossings are more difficult (especially in developed areas), and public safety and security is a bigger concern.

The NTC proposed by Mr. Caudle is a 2,000 cubic-foot per second (cfs) canal from Lake Wright Patman to Lake Ray Roberts, then a 1,200 cfs canal from Lake Ray Roberts to Lake Bridgeport. Mr. Caudle claimed that the NTC could provide 850,000 acre-feet per year to Region C, but he does not indicate the source of this supply. With the exception of Lake Wright Patman, the lakes connected by this strategy (i.e. Chapman, Tawakoni, Fork, Lavon, Hubbard, Lewisville, Grapevine, Ray Roberts, Bridgeport, Eagle Mountain and Worth) are fully allocated. The 2016 Region D IPP shows that Lake O' The Pines will be fully allocated in the future. So again the entire yield of the project would come from Lake Wright Patman at 231 ft-msl, which alone does not have sufficient yield to meet the needs of Region C.

- *The East Texas Canal (ETC).* **Response:** The ETC option connects the following lakes with a series of canals: Toledo Bend, Sam Rayburn, Steinhagen, and Livingston. Mr. Caudle claimed that the ETC could provide 1,000,000 acre-feet per year to Region C: 700,000 ac-ft/yr is expected to come from Toledo Bend, 100,000 ac-ft/yr from Lake Sam Rayburn, 100,000 ac-ft/yr from Lake Steinhagen, and 100,000 ac-ft/yr from Lake Livingston.

The unallocated supply out of Toledo Bend in 2070 is only 19,395 ac-ft/yr, plus the 100,000 ac-ft/yr allocated to Region C, for a total of 119,395 ac-ft/yr which is far less than the 700,000 ac-ft/yr required from the reservoir in the ETC strategy. Lake Livingston is owned by TRA and the City of Houston. Houston's supply is fully allocated after 2020, but TRA may have some available yield. If TRA is unwilling or unable to contract for the 100,000 ac-ft/yr called for in the ETC strategy then the available yield of the project would be further reduced. For these reasons, this strategy does not have sufficient yield to meet the needs of Region C

While most of the lakes in the above strategies are already fully allocated, they could theoretically be used to pass water in the way suggested. However, passing water

through these lakes is complicated by the fact that they are owned by multiple entities and environmental concerns. The applicable water rights and permits would need to be amended to allow for such pass-throughs, and the new water rights could be subject to additional environmental flow requirements as a result. The mixing of waters from various sources is also an important concern, and more detailed studies would need to be performed on the effects on water quality in the receiving water bodies and other environmental considerations (e.g. invasive species).

- *The Arkansas-Texas Canal (ATC).* **Response:** The ATC option is an updated version of a strategy originally studied in a 1976 TWDB Report entitled “An Assessment of Surface Water Supplies of Arkansas: with computations of surplus supplies and a conceptual plan for import to Texas.” This strategy draws from three rivers in Arkansas (White, Arkansas, and Ouachita) using a series of canals and pipelines before finally emptying into Lake Wright Patman. Mr. Caudle pointed out some key benefits of this strategy, namely diversification of water sources to decrease vulnerability to drought, and providing renewable surface water supplies to irrigators in Arkansas that currently rely on diminishing groundwater resources. The ATC is proposed to supplement NTC option described above because, by itself, it is not practical due to the high cost and relatively low yield. To make use of surplus waters from these Arkansas rivers, Mr. Caudle noted that a Title III interstate permit would have to be submitted to the Arkansas Natural Resources Commission and approved by the Arkansas Legislature. Additional studies regarding the inter-basin water transfers and their effect on water quality and other environmental considerations would also be required.
- *Marvin Nichols Cost Estimate.* **Response:** Mr. Caudle’s concerns with the Marvin Nichols Reservoir cost estimate focus on 6 key aspects: 1) the increase in estimated costs for the reservoir from the 2001 Region C Plan through to the 2016 IPP, 2) TWDB guidelines for developing costs, 3) concerns about underestimation of the mitigation rate, 4) concerns about underestimation of land acquisition costs, 5) concerns about underestimation of archaeological impacts, and 6) concerns about underestimation of the amount of free board.

The responses to these concerns are as follows: 1) Cost estimates change with changes to the cost of materials and construction and the development of additional information. It would be indeed troubling if the estimate in the 2016 plan were the same as the estimate in the 2001 plan. 2) TWDB guidelines are followed in order to provide comparable costs for all strategies. 3) The current estimated mitigation rate is based on best available current information. Contingencies will allow for more mitigation if needed. 4) The current estimated land cost is based on best available current information, data on real estate values by county developed and maintained by Real Estate Center at Texas A&M University. 5) Archaeological impacts are accurately stated based on currently available information. 6) Freeboard is based on detailed analysis – more detailed than is typical in preliminary planning – and we believe that it is correct. The goal of TWDB guidelines for developing costs for the purposes of regional water planning is to ensure that strategies are comparable to each other (e.g. all based on the

same unit costs and methodologies for calculating mitigation, contingencies, etc.). In this sense, these are planning-level costs for comparison purposes. A more detailed design-level cost is developed after a strategy is selected for further consideration.

- Clean Water Fund
 - Strengthen municipal water conservation programs. **Response:** Response regarding conservation is presented at the end of this appendix under “General Comments”.
 - Implement a more aggressive and consistent plan to reduce average water consumption in each city to 140 gpcd by 2030. **Response:** Response regarding the State Goal of 140 gpcd is presented at the end of this appendix under “General Comments”.
 - Incorporate drought contingency plans as supply strategies and factor them in to demand forecasts. **Response:** Response regarding drought contingency plans is presented at the end of this appendix under “General Comments”.
 - Increase leak detection and repair programs. **Response:** Response regarding reducing water loss is presented at the end of this appendix under “General Comments”.
 - Explore the potential benefits of Aquifer Storage and Recovery. **Response:** Response regarding ASR is presented at the end of this appendix under “General Comments”.
 - Utilize existing reservoirs before proposing new reservoirs. **Response:** Comment noted.
- Dallas Water Utilities
 - General comparison of Region C Plan to Dallas Long Range Plan. **Response:** Comments noted.
 - Table 1. Summary of Significant Inconsistencies. **Response:** Changes incorporated throughout report as appropriate. See below for details on specific items listed in Table 1.
 - Page 3.7 of IPP. Include Main Stem Balancing Reservoir in list of indirect reuse projects. **Response:** This was not added. Page 3.7 is discussing currently available reuse projects implemented since the 2011 Plan. The Main Stem Balancing Reservoir is not a current reuse supply.
 - Page 5A.11. Include Neches Run-of-River as a WMS requiring an interbasin transfer. **Response:** Neches Run-of-River was added to the list of strategies requiring an interbasin transfer in Section 5A.1.13.
 - Table 5A.3. The maximum IBT amounts for Lake Palestine and Neches Run-of-River Supplies are incorrectly shown. **Response:** Table 5A.3 was corrected to show to maximum IBT from Lake Palestine as 114,337 acre-feet per year and the maximum IBT from Neches Run-of-River as 47,250 acre-feet per year.
 - Page 5B.14. Text on page 5B.14 incorrectly states that the Neches Run-of-River strategy includes conjunctive use with groundwater or tributary storage. **Response:** This statement was referring to the potential alternatives summarized in the Upper Neches River Municipal Water Authority (UNRMWA) Water Supply Project Feasibility Study. The reference to groundwater and tributary storage was removed to avoid confusion.
 - Appendix P – Neches Run-of-River. **Response:** Text was revised to address all comments related to this write-up.

- Texas Conservation Alliance
 - Value of Current Supply. The comment asserts that if the region as a whole can bring the average gpcd to 141, the current supply will be adequate to meet 2070 demands. **Response:** The referenced theoretical demand (14.3M people x 141 gpcd=2,266,113 af/y) would only be the municipal demand, and does not include non-municipal demand for manufacturing, steam electric power, irrigation, mining, and livestock. Even if that theoretical municipal demand were the only demand, the current supply of 2,272,150 af/y would only provide a safety factor of 1.0027. This is an unacceptably low margin of safety by any standard engineering practices. Further response regarding the State Goal of 140 gpcd is presented at the end of this Appendix under General Comments.
 - Municipal Reuse-Recycling. The comments states that “The IPP anticipates 429,018 af/y of reuse in 2070, but in principle there is no reason why all, or almost all return flows could not be used as water supply” and “A Minimum of 80% reuse is a realistic goal”. **Response:**
 - The referenced 2070 reuse supply (427,011 af/y) is only the supply from existing (currently operating) reuse projects (Table 5E.7). An additional 355,118 af/y of reuse projects are planned (Table 5E.8), bringing the total 2070 reuse amount to ~782,000 af/y.
 - The assertion by TCA is that 50% (1.3M of 2.6M af/y) of the water that is used would be returned to wastewater treatment plants, treated, and then be available to be reused. While this 50% has been an assumed standard in the past, recent analysis of return flow data performed by Region C in this round of planning indicate that during the recent drought the percentage of return flow was lower than 50%.
 - The assumption by TCA is that 100% of return flow (~1.3M af/y) would be available for reuse. This does not account for the requirement that some amount of return flow needs to be returned to the natural waterways to support aquatic life. TCEQ typically requires a certain amount of bypass flows (ex, 30% bypass at TRWD wetlands projects) and/or only permits a certain percentage of available return flows to be reused (percentages vary, but are typically around 60% based on most recent permits granted).
 - Region C’s ~782,000 af/y of reuse represents about 60% of the available return flow. Available return flow is assumed to be ~1.32M af/y (45% of total demand of 2,929,880 af/y). Region C’s 782,000 af/y of reuse is consistent with the amount that could reasonably be expected to be permitted.
 - Future Yield of Area Reservoirs. **Response:** Most rain that falls in urbanized DFW is not within the watershed of any Region C water supply reservoirs. Most run-off from Region C urbanized area is in the Lake Livingston watershed in Region H (see article in Nov 2014 Region C newsletter, *Where the Rain Falls Really Matters*). Therefore, the future yield of existing reservoirs in Region C is not likely to increase due to urbanization within these watersheds.
 - Special Significance of Cedar Creek and Richland-Chambers. **Response:**
 - TRWD already makes additional use of Richland-Chambers (R-C) Reservoir through their existing wetlands project which diverts return flow from Trinity River into wetlands and then into Richland-Chambers Reservoir. 2070 WAM yield of R-C is 167,100 af/y and the reuse/wetland project provides an additional 100,465 af/y of supply.

- TRWD plans to make additional use of Cedar Reservoir through their planned wetlands project which will divert return flow from Trinity River into wetlands and then into Cedar Creek Reservoir. 2070 WAM yield of Cedar Creek is 151,783 af/y and the planned reuse/wetland project will provide an additional 88,059 af/y of supply.
- Combined currently permitted yield from these two lakes including associated reuse projects is over 507,000 af/y.
- The TCA assertion is “...if all flows above 500 cubic feet per second (cfs) were diverted ... the two lakes would have a combined firm yield of at least a million AFY.” This assertion appears to be based on records from one USGS streamflow gage record rather than the TCEQ WAM analysis (required by TWDB for regional planning) which considers downstream senior water rights, particularly Lake Livingston. Based on TCEQ WAM analysis, there is very little unpermitted firm yield supply in the Trinity River Basin in Region C.
- A Region C WWP is currently attempting to get an “X-flow” permit for one of its reservoirs, which would enable the capture of additional flood flows during times of high flow. However, TCEQ does not consider this type of permit to be “firm” supply and TWDB does not allow use of it as a reliable supply in regional planning.
- Lake Texoma – a Cost-Effective Source of Supply **Response:** Comments noted. Region C has provided analysis of this strategy in Chapter 5B.
- Marvin Nichols Reservoir – the Most Destructive Project in the Plan. **Response:** Comments noted.
- Sulphur Basin Supplies. TCA asks for a breakdown of how much water is developed under the proposed “Sulphur Basin Supplies” is from Wright Patman and how much is from the 42,000-acre Marvin Nichols. **Response:** The report has been modified to include this information. See Chapters 5A and 5B as well as Appendix P.
- Lake Tehuacana. **Response:** Comments noted.
- Lower Bois d’Arc Creek Reservoir, Ralph Hall Lake, Neches Run-of-the-River Project, Lake Columbia. **Response:** Comments noted.
- Upper Neches River Municipal Water Authority
 - Page 5A.11 Include Neches ROR needing IBT. **Response:** Neches ROR added to text.
 - Page 5A.12 Reflect 114,337 af/y of Palestine as already permitted IBT. **Response:** Palestine maximum amount in Table 5A.3 changed to the permitted amount of 114,337 af/y with the note that the 2030 WAM yield is 110,670 af/y. This lower amount is the supply available to Dallas Water Utilities the first decade online.
 - Page 5A.13 Clarify Neches ROR in Table 5A.3. **Response:** Note added in table regarding existing 18,000 af/y of interbasin transfer that is permitted.
 - Page 5A.16 Confirm amount for Lake Palestine. **Response:** The amount shown as available to Region C from Palestine is 110,670 af/y, which is the WAM yield for the first decade Palestine will be online (2030). Even though the permitted amount is 114,337 af/y, TWDB requires that available supply be limited to the WAM yield.
 - Page 5A.16 Revise amount of Neches ROR for Region C. **Response:** Amount corrected to 47,250 af/y.
 - Page 5A.17 Delete duplicative line in Table 5A.4 for Neches ROR. **Response:** Deleted duplicate row from table.

- Page 5B.6 Neches ROR qualitative impacts are too high. **Response:** Table 5B.2 as well as Tables P.3 and P.4 have been updated to reflect the Neches Run-of-River strategy that does not include an off-channel reservoir.
- Page 5B.14 Delete portion of description for Neches ROR. **Response:** Description edited to remove reference to tributary storage and groundwater.
- Page 5C.10 Delete portion of description for Neches ROR. **Response:** Text edited to remove portion of the description of this project (per Dallas Water Utilities comment).
- Page 8.12 In the first paragraph regarding Lake Fastrill, delete the final sentence. **Response:** Final sentence deleted.
- Pages P.61 through P.64 Revise Tech Memo for Neches ROR
 - Page P.61 2013 Dollars (not 2011 Dollars). **Response:** Corrected.
 - Page P.61 Revise last sentence in 2nd paragraph. **Response:** Sentence deleted per Dallas Water Utilities Comment.
 - Page P.61 In last sentence delete portion of description. **Response:** Text edited to remove portion of the description of this project (per Dallas Water Utilities comment).
 - Page P.62 Replace 40 MGD with 42 MGD. **Response:** Text edited to remove portion of the description of this project (per Dallas Water Utilities comment).
 - Page P.62 Edit text for tributary storage Alternate option. **Response:** Text edited to remove portion of the description of this project (per Dallas Water Utilities comment).
 - Page P.63 Edit text for groundwater Alternate option. **Response:** Text edited to remove portion of the description of this project (per Dallas Water Utilities comment).
 - Page P.63 Replace “2014 Report” with “February 2015 HDR Report”. **Response:** Text edited to remove portion of the description of this project (per Dallas Water Utilities comment).
 - Page P.63 Delete reference to Nueces Off-Channel Reservoir. **Response:** Table removed.
 - Page P.64 Revise Evaluation to reflect this strategy does not include off-channel reservoir. **Response:** Tables P.3 and P.4 have been updated to reflect the Neches Run-of-River strategy that does not include an off-channel reservoir.
- Page P.65 Include references to 2 reports. **Response:** References included.
- Page Q.67 Revise Table Q-38 title and content. **Response:** Revised probable owner and footnote.
- Upper Trinity Regional Water District
 - Page 5C.57 Correct the name of Sulphur River Municipal Water District and Upper Trinity Regional Water District. **Response:** Corrected.
 - Page 5C.86 Clarify relationship of 3 WUGs listed under Mustang SUD. **Response:** Text edited to reflect correct relationship.

- Page H.46 Clarify relationship of 3 WUGs listed under Mustang SUD. **Response:** A footnote has been added to Table H.32 to clarify that these 3 WUGs are wholesale customers of UTRWD, but that Mustang SUD is the contract operator of the systems.
- Page H.47 Correct 2020 “Supplies Less Demand” value. **Response:** Corrected.

General Comments

- Need more conservation and more efficient use of water. **Response:** The Region C Water Planning Group (RCWPG) desires to see the water user groups in Region C achieve a high level of water conservation and efficiency in water systems. Water is an important resource that is vital to the economy of Region C and the State, and Region C desires to use it efficiently. Much progress has already been made, demonstrated by a number of factors. Between the 2011 Plan and 2016 Plan, Region C’s projected 2060 municipal per capita use was reduced from 200 to 165 gpcd, and further reduced to 161 gpcd by 2070. By 2070, Region C anticipates almost 250,000 acre-feet per year of water savings for “build in” water conservation items associated with plumbing fixtures and efficient appliances (Table 5E.9). In addition, Region C anticipates another 135,000 acre-feet per year of water savings from “active” conservation efforts (Table 5E.9). RCWPG recognizes that future technologies may be developed that will enable even more conservation and RCWPG is open to adopting those technologies as strategies in future plans as they become practicable and implementable.
- Need to achieve state goal of 140 gpcd. **Response:** This comment refers to the goal developed by the Water Conservation Implementation Task Force in 2004 for municipal per capita water use (See Section 1.6.3 of this plan). It is important to understand that this 140 gpcd goal is for an average (not dry) year, and that water use originating from reuse projects is not to be included when computing the per capita use (ie, credit for reuse). Regional planning gpcd’s are for dry year (per TWDB guidelines), do not account for future conservation strategy savings, and do not have reuse credited to them. Were Region C’s municipal use to be calculated in the way the Task Force recommended (for an average year, giving credit for the region’s large amount of reuse) it would meet the target of 140 gpcd. (Table 5E.10 of this plan shows the projected normal year municipal gpcd with conservation and reuse to be less than 100 gpcd). Region C’s ability to meet this target is particularly noteworthy given the large amount of non-residential municipal use (commercial and retail) that is included in Region C’s municipal demand as compared to other regions. Examples of this non-residential municipal demand are: DFW Airport, Dallas and Fort Worth Convention Centers, multiple professional sporting facilities (5+), major retail areas (Galleria, Dallas Market, Grapevine Mills, etc), major hospital/medical facilities (UT Southwestern, Baylor, etc), large universities (TCU, SMU, UT Dallas, UNT), and national corporate offices (Exxon Mobil, AT&T, American Airlines, Texas Instruments, etc). It is also important to note that much of the Metroplex’s commercial/retail serves population visiting Region C from other regions.
- Better enforcement of irrigation restrictions. **Response:** The RCWPG supports and encourages the efforts for better enforcement of existing watering restrictions including time-of-day and day of the week watering.

- Reduce water losses (to 10% like Region H). **Response:** Water Loss Reduction is a conservation strategy for any Region C WUGs that had high water losses. Each WUG’s historical water loss was used to determine the amount of water that could be saved through replacement of water lines that were a significant source of water loss. More detail on this is provided in Appendix K. Table Q-10 has also been expanded to show how much conservation savings is attributed to the water loss prevention strategy for each WUGs.
- Drought contingency plans. **Response:** RCWPG maintains its position regarding Drought Contingency Plans as presented in Chapter 7 (Section 7.6)
- Perceived low percentage of WUGs implementing conservation. **Response:** There appears to be a general misunderstanding by the public of the conservation survey data presented in Chapter 5E. In future plans, Region C will strive to present this information more clearly. An example of this misinterpretation follows. *Table 5E.6 presents results of a Region C survey of water retailers related to conservation efforts. The implementation percentages presented in this table represent the percentage of those entities responding to the survey, not the percentages of all water retailers or percentage of population in Region C that implement conservation strategies. For example, Table 5E.6 shows that 43% of the entities responding to the survey have implemented Time-of-Day Watering Restrictions. This does not equate to only 43% of all Region C water retailers that implement this strategy, nor does it equate to only 43% of the population implementing this strategy. For example, while two entities (Fort Worth and Dallas) represent only 1% of the water retailers responding to the survey (2 of 148), these two entities represent about 30% of the Region’s population. Both of these entities have implemented significant watering restrictions, as have most of the larger water retailers in Region C.*
- More reuse/water recycling. **Response:** Reuse (or water recycling) is a major strategy for Region C. Table 5E.7 (existing reuse projects) and Table 5E.8 (reuse strategies) show that Region C will have about 784,000 acre-feet of reuse by 2070. This represents 27% of the overall water use that will be recycled. This exceeds all other regions in the state. RCWPG encourages further reuse of water as is practicable and feasible.
- No New Reservoirs. **Response:** Region C water suppliers do not enter into the planning of reservoirs lightly because they understand the difficulty of developing such projects and the impacts they have. Region C water suppliers would not undertake these reservoir projects if other alternatives were more feasible. Region C water suppliers have an obligation to provide water needed for the future of this region and for the good of the entire state, and have determined that these reservoirs, along with other selected strategies, are necessary to adequately provide for the future.
- Stop further urbanization. **Response:** Region C Water Planning Group and water suppliers do not have control over future growth. At the same time, the RCWPG does have an obligation to plan for the growth that is anticipated.
- Utilize ASR (Aquifer Storage and Recovery). **Response:** An expanded description of ASR will be included in Section 5A.1.11 of the final plan. While several ongoing feasibility studies are being performed within Region C, those studies are not advanced enough to determine the suitability of ASR as a source of supply for Region C at this time. Studies of ASR should continue, and pilot

projects should be implemented if the strategy appears to be promising. ASR projects determined to be viable should be added to future Regional Water Plans.

- Utilize Lake O' the Pines; comments assert that 89,600 af/y is available. **Response:** Based on strategies presented in Region D's 2016 IPP for the Northeast Texas Municipal Water District (Lake O' The Pines water right holder), it is the understanding of Region C that Lake O' The Pines will be fully committed to Region D's future water demands. Table 5A.1 of the Region C Plan has been updated to clarify this.
- Ban/curtail oil fracking due to high water use. **Response:** Mining water use makes up only 2.3% of the total projected demand in 2020 and only 1.5% in 2070. This mining use includes oil and gas fracking as well as other mining operations such as lignite mining for power plants and sand and gravel operations. The 2016 Region C Water Plan does contain several water management strategies of using reuse/recycled water to meet mining demands.
- Plan does not recognize or study the impacts of climate change. **Response:** Although not explicitly stated, the 2016 plan does address the effects of climate change. The use of safe yield rather than firm yield for both Dallas and Tarrant Regional Water District reservoirs is the chosen response to the potential effects of climate change. Future Region C Plans may further refine the anticipated effects of climate change and adjust supplies and strategies accordingly.

Other Changes to the IPP

- Addition of Socio-Economic Analysis by TWDB
- Addition of Infrastructure Funding report generated from Survey of Water Suppliers
- Addition of Sulphur River Basin Authority as a Wholesale Water Provider as designated by Region C Water Planning Group on September 28, 2015.
- Addition of Section 10.6 related to the 2016 Interregional Conflict between Region C and Region D.
- Revision of the Sulphur Basin Supplies strategy pursuant to the mediation agreement reached as part of the 2016 Interregional Conflict between Region C and Region D.
- Addition of Interim 2060 strategy for Tarrant Regional Water District to avoid unmet need precipitated by Interregional Conflict mediation agreement.
- Various editorial changes.
- Addition of Tables required by Texas Water Development Board.
- Revision of some cost estimates.