Region L
South Central Texas Regional Water Planning Group

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DATE: April 27, 2017

TO: Members of the South Central Texas Regional Water Planning Group

FROM: Steven J. Raabe, P.E.

The schedule and location of the meeting of the South Central Texas Regional Water Planning Group is as follows:

TIME AND LOCATION

Thursday, August 3, 2017
9:00 a.m.
San Antonio Water System
Customer Service Building
Room CR C145
2800 US Highway 281 North
San Antonio, Bexar County, Texas 78212

Enclosed is a copy of the posted public meeting notice.

Steven J. Raabe, P.E.

Enclosure
Agenda Packet for August 3, 2017

NOTICE OF OPEN MEETING OF THE
SOUTH CENTRAL TEXAS REGIONAL
WATER PLANNING GROUP

TAKE NOTICE that a meeting of the South Central Texas Regional Water Planning Group as established by the Texas Water Development Board will be held on Thursday, August 3, 2017, at 9:00 AM at San Antonio Water System (SAWS), Customer Service Building, Room CR 145, 2800 US Highway 281 North, San Antonio, Bexar County, Texas. The following subjects will be considered for discussion and/or action at said meeting.

1. Public Comment

2. Approval of the Minutes from the May 4, 2017, Meeting of the South Central Texas Regional Water Planning Group (Region L)

3. Status of Edwards Aquifer Habitat Conservation Plan (HCP) – Nathan Pence, Executive Director EAHCP

4. Status of Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Stakeholder Committee (BBASC) and Expert Science Team (BBEST)

5. Texas Water Development Board (TWDB) Communications

6. Chair's Report

7. Discussion and Appropriate Action Regarding the Adoption of the Guadalupe-Blanco River Authority's (GBRA) Proposed Substitution of an Alternative Water Management Strategy in the 2016 Region L Regional Water Plan, the Mid-Basin Water Supply Project (MBWSP) — Conjunctive Use with Aquifer Storage & Recovery (ASR), for Two Recommended Water Management Strategies in the 2016 Region L Regional Water Plan: 1) the GBRA Mid-Basin Project (ASR), and 2) the Texas Water Alliance (TWA) Carrizo Project.

8. 2021 Plan Enhancement Process: Recap of Guiding Principles Previously Discussed and Adopted

9. Discussion and Appropriate Action Regarding the Adoption of the Environmental Assessment Workgroup's Recommendations on the Following Components of the 2021 Plan Enhancement Process:
    a. The Adequacy Of Evaluating the Plan's Effects on Freshwater Inflows to San Antonio Bay
    b. The Adequacy of Environmental Assessments Of Individual Water Management Strategies

10. Discussion and Appropriate Action Regarding the Status of the Minimum Standards Workgroup

11. Discussion and Appropriate Action Regarding the following components of the 2021 Plan Enhancement Process
    a. The Role of Reuse Within the Regional Water Plan
    b. Identifying Special Studies or Evaluations Deemed Important to Enhance The 2021 Plan and Identification of Outside Funding Sources
    c. The Extent to Which Innovative Strategies Should Be Used

12. Evergreen Underground Water Conservation District Presentation on Weather Modification as a Potential Innovative Water Management Strategy

13. Discussion and Appropriate Action Regarding Consultant's Work and Schedule

14. Possible Agenda Items for the Next Region L Meeting

15. Public Comment

1. Public Comment

2. Approval of the Minutes from the May 4, 2017, Meeting of the South Central Texas Regional Water Planning Group (Region L)

Minutes of the
South Central Texas Regional Water Planning Group
May 4, 2017

Chairwoman Suzanne Scott called the meeting to order at 9:30 a.m. in the San Antonio Water System's (SAWS) Customer Service Building, Room CR 145, 2800 US Highway 281 North, San Antonio, Bexar County, Texas.

28 of the 30 voting members, or their alternates, were present.

Voting Members Present:

Tim Andruss
Pat Calhoun
Gene Camargo
Don Dietzmann
Art Dohman
Alston Beinhorn for Blair Fitzsimons
Charlie Flatten
Vic Hilderbran
Kevin Janak
Russell Labus
Glenn Lord
Peter Schram for Doug McGooky
Dan Meyer
Gary Middleton
Con Mims
Kevin Patteson
Iliana Pena
Robert Puente
Steve Ramsey
Weldon Riggs
David Roberts
Roland Ruiz
Dianne Savage
Suzanne Scott
Greg Sengelmann
Thomas Taggart
Dianne Wassenich
Adam Yablonski

Voting Members Absent

Will Conley
Rey Chavez

Non-Voting Members Present:

Ron Ellis, Texas Water Development Board (TWDB)
Marty Kelly, Texas Department of Parks and Wildlife
Jamie McCool, Texas Department of Agriculture

Non-Voting Members Absent:

Charles Wiedenfeld, Region J Liaison
Don McGhee, Region M Liaison
Ronald Fieseler, Region K Liaison
Carl Crull

Beginning with the February 11, 2016, meeting of the South Central Texas Regional Water Planning Group, all recordings are available for the public at www.regionltexas.org.

All PowerPoint presentations and meeting materials referenced in the minutes are available in the meeting Agenda Packet at www.regionaltexas.org.

AGENDA ITEM NO. 1: (9:00 AM) Planning 101: New Member Orientation (Refresher for Veteran Members) by Texas Water Development Board (TWDB)—Ron Ellis

Ron Ellis, TWDB, presented an introduction to and overview of Regional Water Planning in Texas, specifically with regard to the Fifth Cycle of Regional Water Planning. The presentation included background information on regional and state water planning, regional water planning groups, fundamentals of water planning, and the foundation of the State Water Plan. Members were invited to ask questions throughout the presentation. The presentation is available at www.regionltexas.org.

Toward the end of the presentation, Con Mims asked if the TWDB, by approving a regional water plan, is indicating that said plan meets all of the requirements promulgated by the planning process and rules. Mr. Ellis confirmed that, by approving a regional water plan, the TWDB is confirming that the submitted plan effectively meets the requirements set out by the planning rules and guidelines.

Kevin Janak asked whether a limit set by the Legislature on the amount of funding each region receives for planning purposes, and whether each region receives the same amount. Mr. Ellis responded, noting that the TWDB determines the amount of money each region receives based on several factors. The funding varies from plan to plan, and from region to region.

AGENDA ITEM NO. 2: (10:00 AM) ROLL CALL

Suzanne Scott informed the Planning Group that Don Dietzmann, former voting member representing Groundwater Management Area 9 (GMA 9), was moving out of the area, thereby vacating his eat on the Planning Group. Chair Scott introduced Curt Campbell, who was appointed by GMA 9 as Mr. Dietzmann's replacement, to the Planning Group.

Cole Ruiz, San Antonio River Authority, called the roll, and confirmed a quorum.

AGENDA ITEM NO. 3: PUBLIC COMMENT

Meredith McGuire passed out an alternative water management plan prepared by the Sierra Club. Ms. McGuire described the particulars of the plan, and noted that it drew from practices employed by the City of Melbourne, Australia during the recent drought that affected the city. Ms. McGuire stressed the importance of bringing the water use per person down.

Alan Montemayor, also with the Sierra Club, continued the message of the alternative water management plan. Mr. Montemayor asked planning group members to pass the information along to their staffs and to provide feedback to the Sierra Club on the alternative water management plan.

AGENDA ITEM NO. 4: APPROVAL OF THE MINUTES FROM THE FEBRUARY 2, 2017, MEETING OF THE SOUTH CENTRAL TEXAS REGIONAL WATER PLANNING GROUP (SCTRWPG)

Glenn Lord made a motion to approve the minutes from January 2, 2017, meeting of the SCTRWPG. Tim Andruss seconded the motion. There were no objections. The motion passed by

consensus.

AGENDA ITEM NO. 5: STATUS OF EDWARDS AQUIFER HABITAT CONSERVATION PLAN (HCP) – NATHAN PENCE, EXECUTIVE DIRECTOR EAHCP

Nathan Pence briefed the Planning Group on the implementation of the Edwards Aquifer Habitat Conservation Plan. Mr. Pence notified the Planning Group that the EAA is in the fifth year of implementation, the habitation restoration was making huge impacts on the springs systems, and the VISPO, ASR, and Regional Water Conservation programs were almost 90 percent complete. Refugia was in place, and things were generally doing well. Additionally the National Academy of Science had lauded the HCP as an enormous success so far.

AGENDA ITEM NO. 6: STATUS OF GUADALUPE, SAN ANTONIO, MISSION, AND ARANSAS RIVERS AND MISSION, COPANO, ARANSAS, AND SAN ANTONIO BAYS BASIN AND BAY STAKEHOLDER COMMITTEE (BBASC) AND EXPERT SCIENCE TEAM (BBEST)

Chair Scott briefed the Planning Group on the BBASC's recent efforts to recharge interest in BBASC operations. She informed the group that several vacancies were filled on the BBASC, and that the meeting rules were being looked at to see if changes were needed. Ms. Scott also informed the Planning Group that the BBASC continues to receive updates on the ongoing studies for instream flow validation efforts.

AGENDA ITEM NO. 7: TEXAS WATER DEVELOPMENT BOARD (TWDB) COMMUNICATIONS

Ron Ellis informed the Planning Group that the Planning Rules were revised, and a new version of the rules was being printed. Additionally, the TWDB had approved the applications to amend the planning contracts to expand the scope of work and budget for the Planning Group. Mr. Ellis also noted that an application period was for TWDB Agriculture Conservation Grants. The deadline was coming up on May 10, 2017. Mr. Ellis provided dates and deadlines for demand projections, and added that TWDB Direct Kathleen Jackson had been reappointed.

AGENDA ITEM NO. 8: CHAIR'S REPORT

Chairwoman Scott provided updates to the planning group, which included a legislative report that was provided in the packet for the benefit of Planning Group members. There was some general discussion about several bills that had been filed, but no action was taken.

AGENDA ITEM NO. 9: DISCUSSION AND APPROPRIATE ACTION AUTHORIZING THE ADMINISTRATOR TO REQUEST WRITTEN APPROVAL FROM THE EXECUTIVE ADMINISTRATOR OF THE TWDB FOR THE GUADALUPE-BLANCO RIVER AUTHORITY'S (GBRA) PROPOSED SUBSTITUTION OF AN ALTERNATIVE WATER MANAGEMENT STRATEGY FOR TWO RECOMMENDED WATER MANAGEMENT STRATEGIES IN THE SCTRWPG 2016 PLAN, OR A DETERMINATION OF WHETHER GBRA'S PROPOSED ACTION CONSTITUTES A MINOR OR MAJOR AMENDMENT

Kevin Patteson delivered a presentation on GBRA's plans to substitute an alternative water management strategy, identified in the SCTRWPG 2016 Regional Water Plan, for two

recommended water management strategies, identified in the SCTRWPG 2016 Regional Water Plan. The presentation and Power Point are available at www.regionltexas.org.

There were several questions relating to the status of permits related to the substitution proposal. Mr. Patteson explained that GBRA is most focused on the groundwater component of the substitution, while the ASR and off-channel reservoir components would probably take a couple decades to develop and implement to meet the projected future need.

Ron Ellis explained to the Planning Group the process of substituting projects in the regional water plan, which is prescribed in TWDB rules. Before the Planning Group can make any revisions to a regional water plan, they must seek approval from the TWDB that the proposed revision qualifies as either a 1) substitution, 2) minor amendment, or 3) major amendment. GBRA is proposing a revision, and seeking the TWDB to approve the revision as a qualified "substitution." The process that follows a substitution, as opposed to a minor or major amendment, varies. The action needed at the present was to authorize the administrator to seek confirmation from the TWDB as to whether the proposed revision indeed constitutes a substitution as provided by in the TWDB Regional Water Planning Rules. Additionally, the action should authorize SARA to request the TWDB to specify which other type of amendment the proposed revision constitutes, in the event that the Executive Administrator disagrees that the revision is a "substitution."

Greg Sengelmann motioned to authorize the Administrator to submit a request to the Executive Administrator of the TWDB to approve GBRA's proposed revision as a substitution, and—in the event that the Executive Administrator disapproves of the proposal—to identify whether the proposed revision is a minor amendment or a major amendment. Con Mims seconded the motion. There were no objections. Gary Middleton abstained. The motion carried.

AGENDA ITEM NO. 10: 2021 PLAN ENHANCEMENT PROCESS: RECAP OF GUIDING PRINCIPLES PREVIOUSLY DISCUSSED AND ADOPTED

Chair Scott reviewed the previously approved Guiding Principles, highlighted some changes made to the 2021 Plan Enhancement Schedule, and reminded the planning group of the 2021 Plan Enhancement Process.

AGENDA ITEM NO. 11: STATUS OF ENVIRONMENTAL ASSESSMENT WORKGROUP'S PROGRESS ON THE FOLLOWING COMPONENTS OF THE 2021 PLAN ENHANCEMENT PROCESS

a) THE ADEQUACY OF EVALUATING THE PLAN'S EFFECTS ON FRESHWATER INFLOWS TO SAN ANTONIO BAY

b) THE ADEQUACY OF ENVIRONMENTAL ASSESSMENTS OF INDIVIDUAL WATER MANAGEMENT STRATEGIES

Steven Siebert (SAWS), Chair of the Environmental Assessment Workgroup, briefed the Planning Group on progress made toward developing a guiding principle to recommend to the Planning Group, which would address the adequacy of evaluating the regional water plan's effects on freshwater inflows, and the adequacy of environmental assessments of individual water management strategies. Mr. Siebert explained that the workgroup was focusing on the structure of the environmental assessment, and how it could be improved. Additionally, the workgroup showed interest in advancing a realism approach to the environmental assessment component of the plan. The goal of the workgroup is to achieve guidelines that improve the structure and comprehension

of the environmental assessment portions of the plan, while introducing a realistic understanding of the plans effects on the environment.

AGENDA ITEM NO. 12: DISCUSSION AND APPROPRIATE ACTION REGARDING THE FOLLOWING COMPONENTS OF THE 2021 PLAN ENHANCEMENT PROCESS

a. **HOW WATER MANAGEMENT STRATEGIES ARE CATEGORIZED; E.G. RECOMMENDED, ALTERNATE, NEEDING FURTHER STUDY**
b. **ESTABLISHING MINIMUM STANDARDS FOR WATER MANAGEMENT STRATEGIES INCLUDED IN THE PLAN**
c. **MAINTAINING MANAGEMENT SUPPLIES WHILE AVOIDING "OVER PLANNING"**

Tim Andruss, Chair of the Minimum Standards Workgroup, briefed the Planning Group on the progress made toward achieving guiding principles on the categorization of water management strategies, establishing minimum standards, and maintaining management supply. Mr. Andruss informed the group that they are working on developing recommendations for the Planning Group to consider.

AGENDA ITEM NO. 13: DISCUSSION AND APPROPRIATE ACTION REGARDING THE FOLLOWING COMPONENTS OF THE 2021 PLAN ENHANCEMENT PROCESS

a. **THE ROLE OF REUSE WITHIN THE REGIONAL WATER PLAN**

For the full dialogue and Power Point presentation on this agenda item, please access the recording and agenda packet of the May 4, 2017, meeting at www.regionltexas.org.

Brian Perkins gave an informational presentation on the Planning Group's historic approach to reuse and effluent.

Mr. Perkins began by providing a high level overview of effluent in the region, and how return flow factors vary among water users (i.e. irrigation, commercial, residential, manufacturing, steam-electric, cooling, etc...).

Effluent is modeled in the Regional Planning Water Availability Model (WAM) as 1) return flow factors on water rights, and 2) point discharges, which are not directly tied to a water right. Point discharges modeling is used to emulate historic discharges from most wastewater treatment plants (WWTPs).

Reuse is water that has been used by an entity once, then treated at a WWTP, and then reused by either the same entity or another community in some beneficial use. Mr. Perkins explained the differences between direct versus indirect reuse, and potable verse non-potable reuse. Using a hypothetical municipal utility, Mr. Perkins explained that a demand may be met by a reuse water management strategy. A utility's influent/ effluent is assumed to be 60 percent of its projected demand. Thus, if a utility projects a demand of 100,000 acre-feet per year, it is assumed for planning purposes that the WWTP will discharge 60,000 acre-feet per year of effluent for potential reuse. Historically, the Planning Group has not distinguished potable from non-potable reuse at this stage. If the discharge sufficiently exceeds the unmet need (for example 20,000 acre-feet per year), the proposed reuse water management strategy is deemed feasible.

Mr. Perkins continued, saying that reuse is included in the current Region L Plan in as 1) existing

supply, or 2) to as a water management strategy. Currently (2016 SCTRWP), SAWS, San Marcos, New Braunfels, GBRA, SARA, Kyle, Kennedy, and Boerne have reuse supplies.

Mr. Perkins also noted that reuse and effluent becomes relevant in the development of hydrologic assumptions for the Planning Cycle, which must be approved by the TWDB.

A high level conversation ensued amongst Planning Group members regarding the impacts of how the Planning Group treats reuse in the planning process, specifically with regard to WAM Run 3. Chair Scott suggested that a workgroup be created to develop the hydrologic assumptions at a future meeting. That workgroup would address the reuse issue.

Further discussion revealed that perhaps a workgroup would not be necessary. The Planning Group resolved that the Mr. Perkins would offer a presentation at a future meeting on the hydrologic assumptions to get everyone up to speed on the process, and to provide clarity. At that point, the Planning Group could decide how to move forward, either with the creation of a workgroup or not.

b. IDENTIFYING SPECIAL STUDIES OR EVALUATIONS DEEMED IMPORTANT TO ENHANCE THE 2021 PLAN AND IDENTIFICATION OF OUTSIDE FUNDING SOURCES

Brian Perkins reminded the Planning Group that the TWDB allocated funding for special projects. Region L completed five studies with these funds. Those included two environmental assessments, one related to water management strategies, the other on harvest equations in the estuary. One study focused on brush management. One focused on an all-inclusive conservation study. The last one focused on Lower Guadalupe Water Supply Project. The funding was provided exclusive from the funding dedicated to the tasks prescribed by the TWDB rules. However, it was noted that moving forward, there were no funds allocated from TWDB for special studies or evaluation. Mr. Perkins pointed out that, to the extent that an innovative strategy or something new emerges, and the Planning Group wants to evaluate it under the water management strategy budget, the Planning Group could choose to evaluate it within the context of the regional water planning scope of work. Any studies, not meeting the criteria of water management strategy would require additional funding, dedicated outside the current budget. Thus, sponsors of such a study would have to commit the funds outside the TWDB funding.

From this Mr. Perkins segued to innovative strategies included in past regional water plans.

c. THE EXTENT TO WHICH INNOVATIVE STRATEGIES SHOULD BE USED

Brian Perkins reminded the Planning Group of innovative strategies used in past regional water plans. These included advanced water conservation, drought management, reuse/ recycle programs, brackish groundwater desalination, seawater desalination, aquifer storage and recovery, brush management, rainwater harvesting, weather modification/ cloud seeding, and other special studies.

Discussion ensued regarding a number of different potential innovated water management strategies that could be further discussed and incorporated in the 2021 Regional Water Plan. Members and the public were encouraged to bring their ideas and corresponding funding forward at future meetings (funding for those innovative strategies that do not meet the criteria of water management strategy or water management strategy project). While no action was taken during this item, each topic was tabled for the next regularly scheduled Region L meeting.

AGENDA ITEM NO. 14: DISCUSSION AND APPROPRIATE ACTION REGARDING CONSULTANT'S WORK AND SCHEDULE

Brian Perkins briefly reviewed the consultants schedule for the fifth cycle of regional water planning, and disseminated a list of ongoing projects Black and Veatch and their subcontractors are involved with on a contractual level.

Mr. Perkins reminded the Planning Group that it has the opportunity to designate "sub-WUGs" to elevate water utilities, who do not currently meet TWDB's threshold for WUG classification, to "Water User Group" status. However, no such utilities had come forward to request WUG status, despite having reached out to each one within the regional water planning area. Mr. Perkins made a recommendation that no changes to the current list be made, unless a non-WUG utility came forward to request WUG status. While no action was taken, the recommendation was generally accepted with no objections.

Lastly, Mr. Perkins briefed the Planning Group on recent efforts to disseminate TWDB water demand and population projection information throughout the regional water planning area, and solicit feedback. As a result of having sent out the surveys, Mr. Perkins received feedback from about 22 percent the water utilities, representing 75 percent of the population. While not every utility responded to the initial survey, the major water utilities throughout the region responded. Additionally, Mr. Perkins announced that the Regional Water Alliance, a group of water purveyors throughout the region, would be holding a workshop on May 12, 2017. Part of the impetus behind the Workshop was to drive more responses from water utilities throughout the region.

AGENDA ITEM NO. 15: TEXAS COMPTROLLER OF PUBLIC ACCOUNTS PRESENTATION: IMPACT OF FEDERAL LISTING OF FRESHWATER MUSSELS AS ENDANGERED OR THREATENED SPECIES – KIMBERLEY A. HORNDESKI

Kimberley Horndeski, with the Texas Comptroller of Public Accounts, gave a presentation on the Comptroller's ongoing Central Texas Freshwater Mussels study, and its 12 month finding report. The purpose of the study was to identify state funding priorities based on immediacy of listing decisions, existing data gaps, and the potential impacts of listing decisions. Specifically, the study produced findings on impoundments, sedimentation, dewatering, chemical contaminants, and sand and gravel mining. The full recording and Power Point presentation is available at www.regionltexas.org.

AGENDA ITEM NO. 16: POSSIBLE AGENDA ITEMS FOR THE NEXT REGION L MEETING

A. ADOPTING SUBSTITUTION TO 2016 REGION L REGIONAL WATER PLAN
B. WORKGROUP UPDATES
C. REVIEW AND RECOMMEND REVISION REQUEST REGARDING DRAFT POPULATION DEMAND PROJECTIONS
D. SAWS 2017 WATER MANAGEMENT PLAN

The planning group reviewed the items scheduled for the next meeting. No items were added.

AGENDA ITEM NO. 17: PUBLIC COMMENT

No comments were made.

Chair Scott adjourned the meeting.

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GARY MIDDLETON, SECRETARY

Approved by the South Central Texas Regional Water Planning Group at a meeting held on August 3, 2017.

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SUZANNE SCOTT, CHAIR

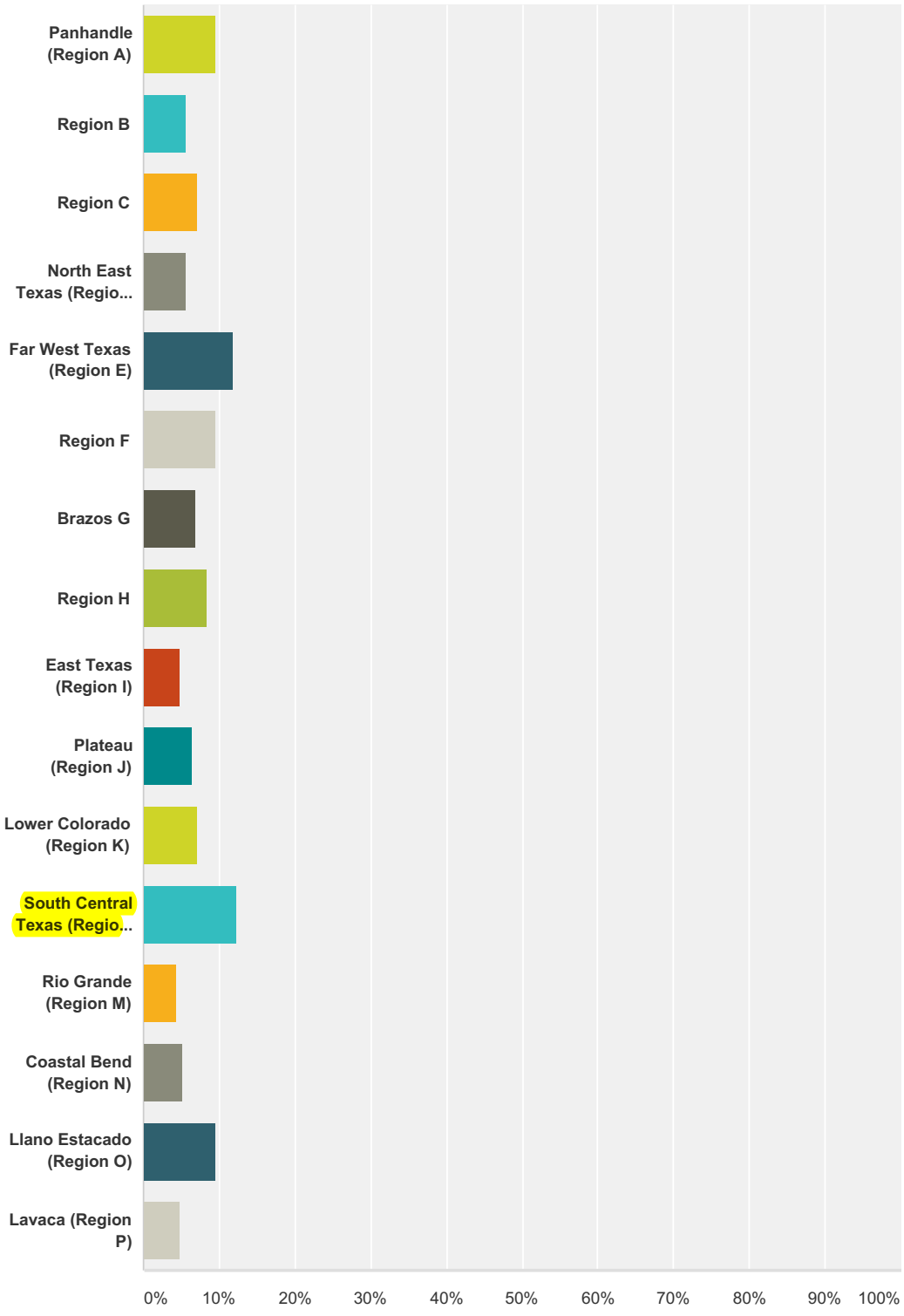
3. Status of Edwards Aquifer Habitat Conservation Plan (HCP) – Nathan Pence, Executive Director EAHCP

4. Status of Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Stakeholder Committee (BBASC) and Expert Science Team (BBEST)

5. Texas Water Development Board (TWDB) Communications

Q1 Which Regional Water Planning Group(s) (RWPG) are you associated with?

Answered: 250 Skipped: 0

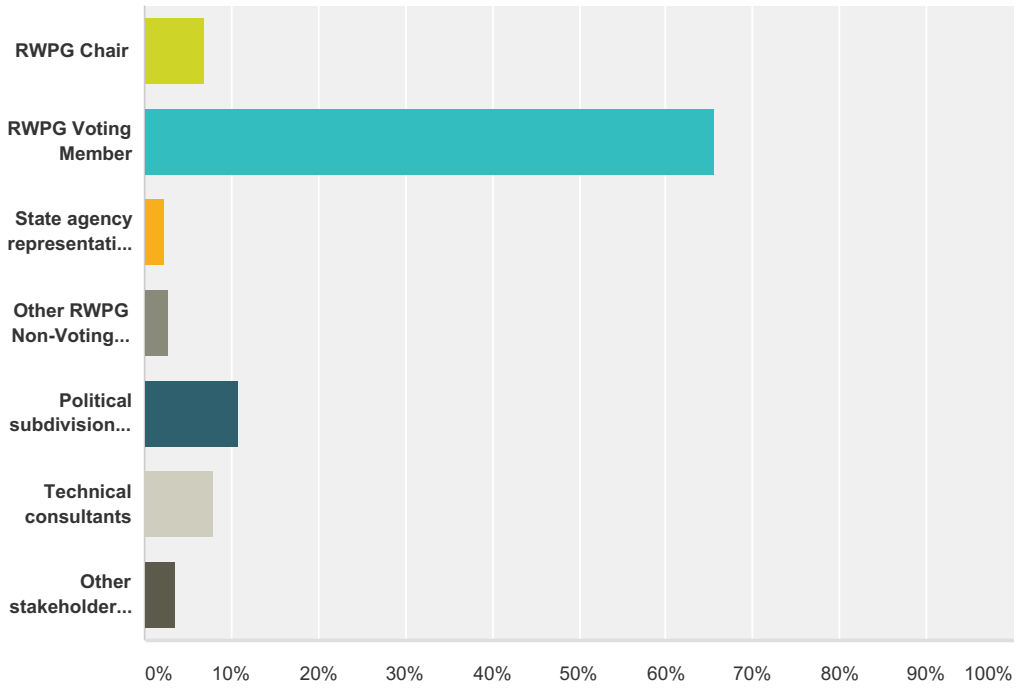


Answer Choices	Responses

Panhandle (Region A)	**9.60%**	24
Region B	**5.60%**	14
Region C	**7.20%**	18
North East Texas (Region D)	**5.60%**	14
Far West Texas (Region E)	**12.00%**	30
Region F	**9.60%**	24
Brazos G	**6.80%**	17
Region H	**8.40%**	21
East Texas (Region I)	**4.80%**	12
Plateau (Region J)	**6.40%**	16
Lower Colorado (Region K)	**7.20%**	18
South Central Texas (Region L)	**12.40%**	31
Rio Grande (Region M)	**4.40%**	11
Coastal Bend (Region N)	**5.20%**	13
Llano Estacado (Region O)	**9.60%**	24
Lavaca (Region P)	**4.80%**	12
Total Respondents: 250		

Q2 Please indicate your primary role in the regional planning process:

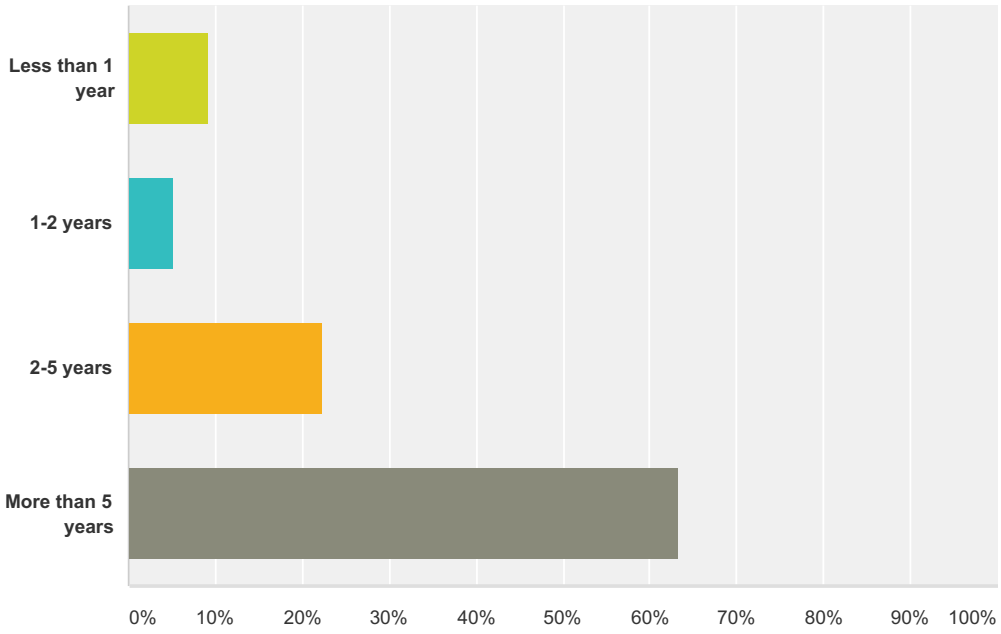
Answered: 250 Skipped: 0



Answer Choices	Responses	
RWPG Chair	**6.80%**	17
RWPG Voting Member	**65.60%**	164
State agency representative (non-voting)	**2.40%**	6
Other RWPG Non-Voting Member	**2.80%**	7
Political subdivision staff	**10.80%**	27
Technical consultants	**8.00%**	20
Other stakeholder (Please specify)	**3.60%**	9
Total		**250**

Q3 How many years have you been directly involved in regional water planning?

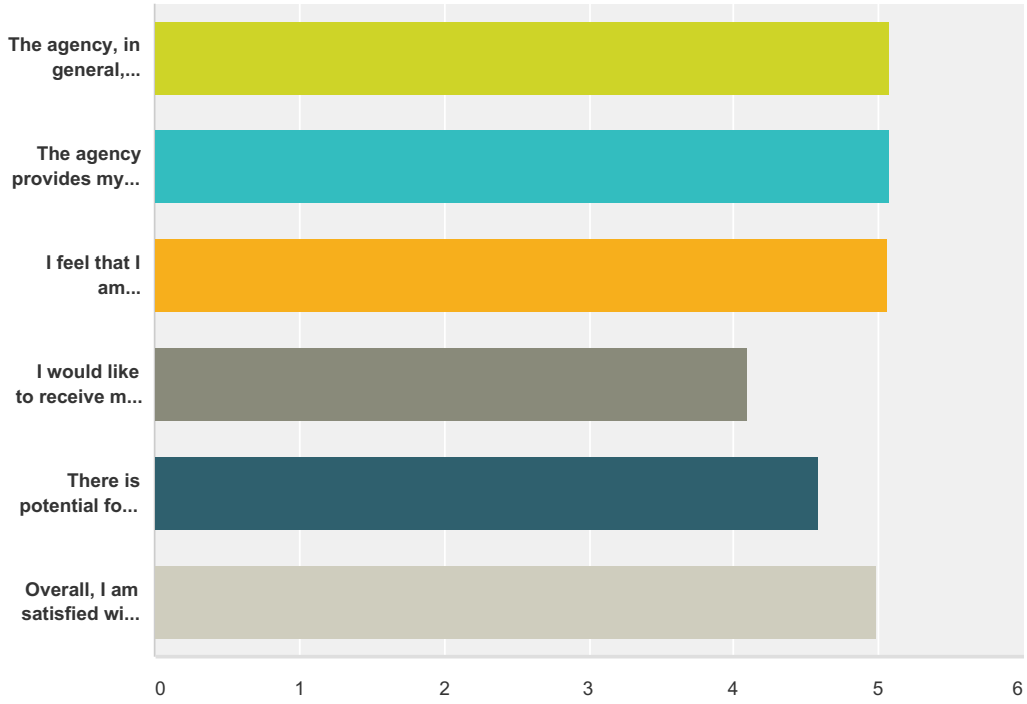
Answered: 250 Skipped: 0



Answer Choices	Responses	
Less than 1 year	**9.20%**	23
1-2 years	**5.20%**	13
2-5 years	**22.40%**	56
More than 5 years	**63.20%**	158
Total		**250**

Q4 TWDB Agency-wide staff

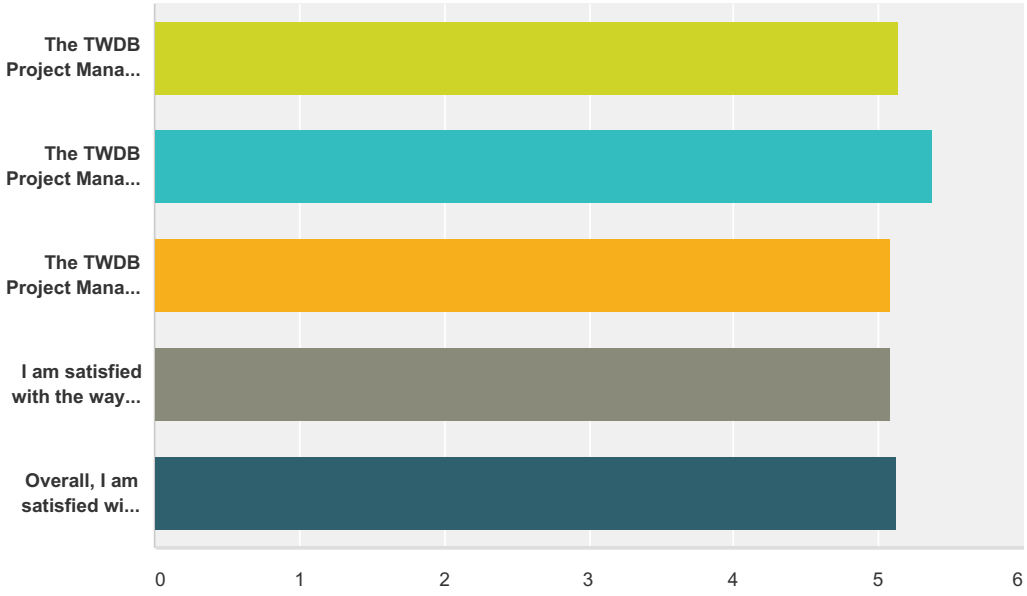
Answered: 228 Skipped: 22



	0 = Not Applicable	1 = Strongly disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly agree	Total	Weighted Average
The agency, in general, provides my planning group adequate assistance on technical matters in a timely and appropriate manner.	**1.77%** 4	**0.00%** 0	**0.44%** 1	**11.50%** 26	**60.18%** 136	**26.11%** 59	226	5.07
The agency provides my planning group adequate assistance on administrative matters in a timely and appropriate manner.	**2.19%** 5	**0.88%** 2	**0.44%** 1	**10.96%** 25	**55.26%** 126	**30.26%** 69	228	5.07
I feel that I am well-informed and understand my role in the regional water planning process.	**1.76%** 4	**0.44%** 1	**3.52%** 8	**11.45%** 26	**50.22%** 114	**32.60%** 74	227	5.06
I would like to receive more orientation materials and training.	**6.61%** 15	**3.08%** 7	**11.45%** 26	**40.97%** 93	**29.07%** 66	**8.81%** 20	227	4.09
There is potential for improvement in how TWDB supports the regional water planning process.	**0.88%** 2	**0.88%** 2	**4.87%** 11	**36.28%** 82	**45.58%** 103	**11.50%** 26	226	4.59
Overall, I am satisfied with the support my planning group receives from TWDB as an agency in carrying out the regional water planning process.	**0.44%** 1	**0.88%** 2	**3.54%** 8	**13.27%** 30	**58.41%** 132	**23.45%** 53	226	4.99

Q5 TWDB Project Manager (for your Region)

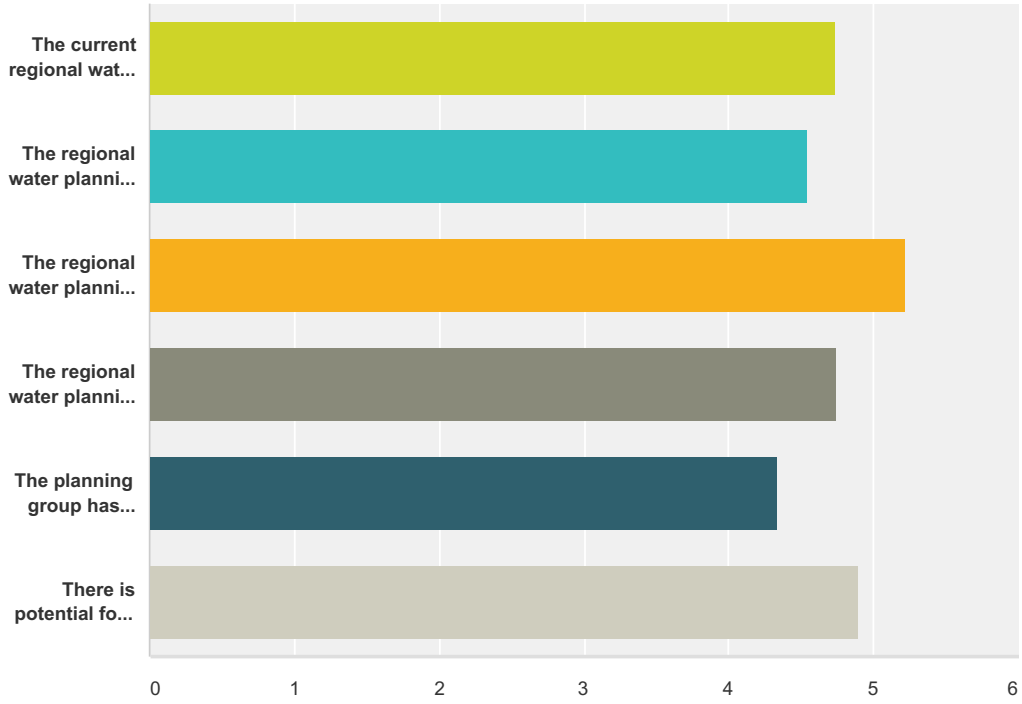
Answered: 225 Skipped: 25



	0 = Not Applicable	1 = Strongly disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly agree	Total	Weighted Average
The TWDB Project Manager provides the necessary technical and administrative guidance so that my planning group can successfully complete all planning tasks and meet all deadlines.	**1.79%** 4	**0.00%** 0	**0.45%** 1	**11.61%** 26	**52.68%** 118	**33.48%** 75	224	5.14
The TWDB Project Manager exhibits professionalism and competence during public meetings.	**1.35%** 3	**0.00%** 0	**0.00%** 0	**5.83%** 13	**44.84%** 100	**47.98%** 107	223	5.37
The TWDB Project Manager is responsive and available to offer assistance when called upon outside of meetings.	**3.59%** 8	**0.45%** 1	**0.45%** 1	**15.70%** 35	**38.57%** 86	**41.26%** 92	223	5.09
I am satisfied with the way the TWDB Project Manager administers the TWDB contract.	**2.68%** 6	**0.00%** 0	**1.34%** 3	**13.39%** 30	**48.21%** 108	**34.38%** 77	224	5.08
Overall, I am satisfied with the support my planning group receives from TWDB staff in carrying out the regional water planning process.	**1.34%** 3	**0.00%** 0	**1.79%** 4	**10.71%** 24	**54.91%** 123	**31.25%** 70	224	5.12

Q6 Implementation of the regional water planning process

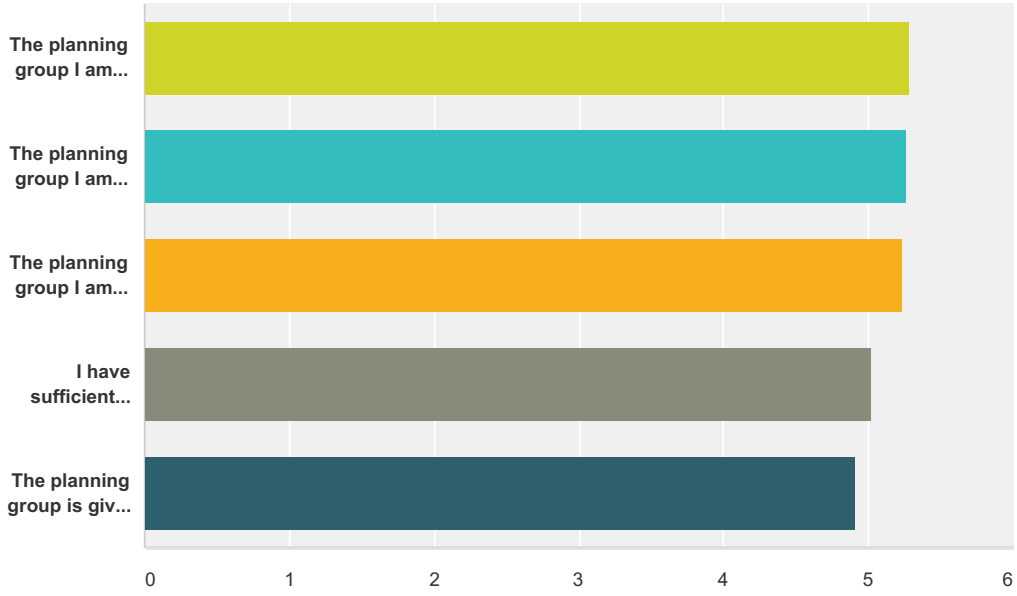
Answered: 220 Skipped: 30



	0 = Not Applicable	1 = Strongly disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly agree	Total	Weighted Average
The current regional water planning process is effective in planning for the long-term water supplies in Texas.	**0.45%** 1	**1.36%** 3	**8.18%** 18	**21.82%** 48	**50.91%** 112	**17.27%** 38	220	4.73
The regional water planning process provides a realistic assessment of both drought conditions and what should be done to meet water needs.	**0.45%** 1	**1.82%** 4	**11.82%** 26	**26.36%** 58	**47.73%** 105	**11.82%** 26	220	4.55
The regional water planning process is open and accessible to me and the public.	**0.45%** 1	**0.45%** 1	**2.27%** 5	**8.18%** 18	**50.45%** 111	**38.18%** 84	220	5.22
The regional water planning process has improved over recent planning cycles.	**2.76%** 6	**2.30%** 5	**2.76%** 6	**25.81%** 56	**42.40%** 92	**23.96%** 52	217	4.75
The planning group has sufficient resources to develop and adopt the regional plans.	**0.46%** 1	**3.65%** 8	**16.89%** 37	**28.31%** 62	**41.55%** 91	**9.13%** 20	219	4.34
There is potential for improvement to the regional water planning process.	**0.46%** 1	**0.00%** 0	**3.21%** 7	**22.48%** 49	**53.21%** 116	**20.64%** 45	218	4.90

Q7 Region-specific questions

Answered: 219 Skipped: 31



	0 = Not Applicable	1 = Strongly disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly agree	Total	Weighted Average
The planning group I am associated with is well-served by its political subdivision (the entity who administers the contract).	**2.30%** 5	**0.00%** 0	**0.00%** 0	**11.98%** 26	**36.87%** 80	**48.85%** 106	217	5.28
The planning group I am associated with consistently meets at a frequency appropriate for its activities.	**1.38%** 3	**0.00%** 0	**0.46%** 1	**7.80%** 17	**50.46%** 110	**39.91%** 87	218	5.26
The planning group I am associated with is well-served by its technical consultants.	**1.38%** 3	**0.46%** 1	**2.30%** 5	**7.83%** 17	**44.70%** 97	**43.32%** 94	217	5.24
I have sufficient understanding and information when making decisions.	**1.84%** 4	**0.46%** 1	**1.84%** 4	**14.29%** 31	**52.53%** 114	**29.03%** 63	217	5.02
The planning group is given sufficient time to make decisions.	**1.38%** 3	**0.92%** 2	**5.50%** 12	**15.60%** 34	**50.46%** 110	**26.15%** 57	218	4.91

Q8 Please provide any additional feedback you would like to share regarding TWDB services and the administration of the regional and state water planning processes.

Answered: 41 Skipped: 209

6. Chair’s Report

7. Discussion and Appropriate Action Regarding the Adoption of the Guadalupe-Blanco River Authority's (GBRA) Proposed Substitution of an Alternative Water Management Strategy in the 2016 Region L Regional Water Plan, the Mid-Basin Water Supply Project (MBWSP) — Conjunctive Use with Aquifer Storage & Recovery (ASR), for Two Recommended Water Management Strategies in the 2016 Region L Regional Water Plan: 1) the GBRA Mid-Basin Project (ASR), and 2) the Texas Water Alliance (TWA) Carrizo Project.

Proposed Substitution of an Alternative Water Management Strategy

GBRA

Guadalupe-Blanco River Authority
flowing solutions

Overview

- GBRA's Substitution Request
- Texas Administrative Code/TWDB Rules
- Review of affected Water Management Strategies
- Questions

GBRA

Guadalupe-Blanco River Authority
flowing solutions

Substitution Request

Conjunctive Use with Aquifer Storage and Recovery

Water Management Strategy

- 42,000 acre-feet/yr
  - Carrizo Groundwater - 15,000 acre-feet/yr
  - Guadalupe River ASR - ~27,000 acre-feet/yr

Substitution Request

The proposed substitution replaces the following two recommended strategies:

1) GBRA Mid-Basin Project with Aquifer Storage & Recovery (50,000 a-ft/yr)
2) Texas Water Alliance Carrizo Project (15,000 a-f/yr, MAG Limited)
   - TWA has provided a letter supporting GBRA's strategy substitution.

Substitution Request

- GBRA intends to purchase Texas Water Alliance's Carrizo groundwater assets; however, the current recommended strategy in the 2016 Region L Water Plan does not include production of Carrizo groundwater.

- The Conjunctive Use with ASR Alternative Strategy incorporates the existing recommended strategy's surface water ASR and incorporates groundwater production volumes associated with TWA's Carrizo project.

- The Alternative Strategy is configured to include an ASR well field that is co-located with the Carrizo well field on TWA leased property in northern Gonzales County and eastern Caldwell County.

TWDB Substitution Requirements

- RULE §357.51 - Amendments to Regional Water Plans, Texas Administrative Code:
  (e) Substitution of Alternative WMSs.
  - "…RWPGs may substitute one or more evaluated Alternative Water Management Strategies for a recommended strategy if the strategy originally recommended is no longer recommended and the substitution of the Alternative WMS is capable of meeting the same Water Need without over-allocating any source.
  - Proposed substitutions must receive written approval from the EA prior to substitution by the RWPG."

TWDB Substitution Approval

- " I have reviewed Region L's May 16, 2017 request for a water management strategy substitution. Based on the request and supporting materials provided, I am approving the substitution of the alternative GBRA Mid-Basin Water Supply Project – Conjunctive Use with ASR. . ."
- "The requested water management strategy substitution meets the requirements of 31 Texas Admin. Code 357.51(e) as the proposed recommended water management strategy is a fully-evaluated alternative water management strategy that is capable of meeting the same water needs without over-allocating any source."

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

June 13, 2017

Ms. Suzanne Scott, Chair
Region L Regional Water Planning Group
P.O Box 839980
San Antonio, Texas 78283

Dear Ms. Scott:

I have reviewed Region L's May 16, 2017 request for a water management strategy substitution. Based on the request and supporting materials provided, I am approving the substitution of the alternative Guadalupe Blanco River Authority (GBRA) Mid-Basin Water Supply Project—Conjunctive Use with Aquifer Storage & Recovery (ASR) water management strategy for the recommended GBRA Mid-Basin Project—Surface Water with ASR and Texas Water Alliance Regional Carrizo Aquifer Development water management strategies.

The requested water management strategy substitution meets the requirements of 31 Texas Administrative Code §357.51(e) as the proposed recommended water management strategy is a fully-evaluated alternative water management strategy that is capable of meeting the same water needs without over-allocating any source.

If the Region L Regional Water Planning Group (RWPG) adopts the substitution, please submit written documentation of the substitution to the Texas Water Development Board (TWDB). Written documentation must include an addendum to the 2016 Region L Regional Water Plan, updated DB17 data to reflect all associated changes to the 2016 Region L Regional Water Plan, and an updated recommended project prioritization list. Within 30 days of receipt of all required information, the TWDB Executive Administrator will issue a response letter to the RWPG Chair and political subdivision acknowledging receipt of the associated documentation. If the documentation meets TWDB requirements, the TWDB Board may consider amending the 2017 State Water Plan, following a 30-day public notice and public hearing.

If you have any questions concerning this approval or its associated requirements, please contact Ron Ellis, Region L Project Manager, at 512-463-4146.

Sincerely,

Jeff Walker
Executive Administrator

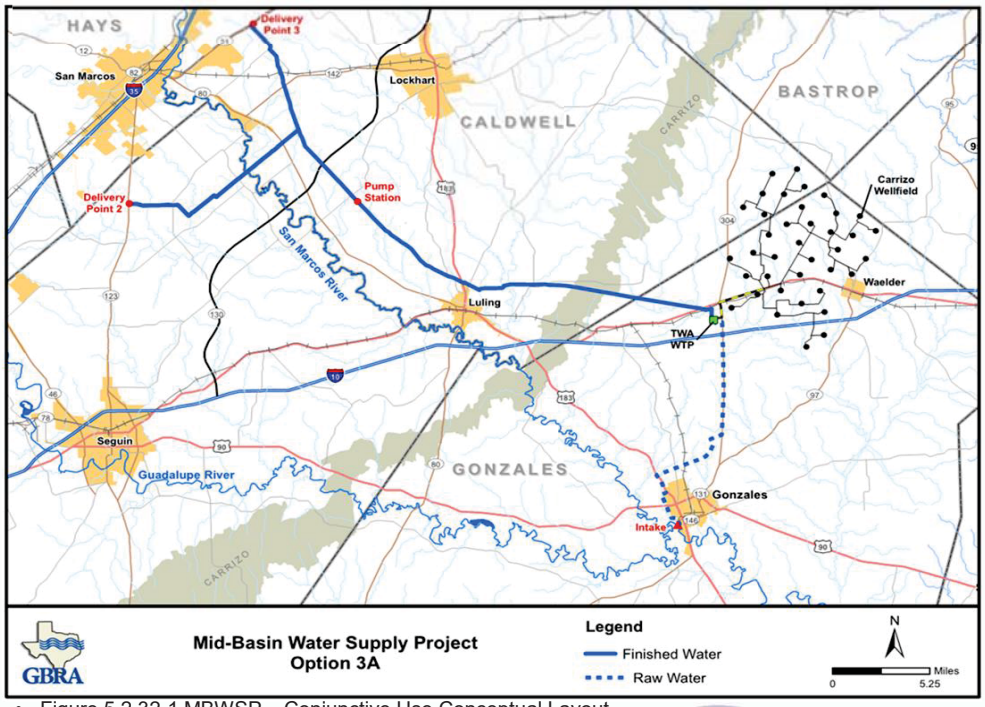
cc: Steve Raabe, San Antonio River Authority
Ron Ellis, TWDB

Our Mission
To provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas

Board Members
Bech Bruun, Chairman | Kathleen Jackson, Board Member | Peter Lake, Board Member

Jeff Walker, Executive Administrator

Conjunctive Use with ASR



- Figure 5.2.32-1 MBWSP – Conjunctive Use Conceptual Layout
- 2016 South Central Texas Regional Water Plan, Volume II

Conjunctive Use with ASR

- This phased project incorporates a Carrizo well field that produces groundwater and stores treated surface water from the Guadalupe River.
  - When surface water supplies available from the river exceed demands and there is unused capacity in the water treatment plant and delivery system, the excess surface water is treated and stored in the Carrizo Aquifer through ASR wells.
- Water will supply needs to WUGs identified with the previously recommended strategies in:
  - Caldwell, Comal, Hays, and Guadalupe Counties.
- 42,000 acre-feet/yr
  - Carrizo Groundwater - 15,000 acre-feet/yr
  - Guadalupe River - ~27,000 acre-feet/yr

Conjunctive Use with ASR

- **Gonzales County Carrizo Groundwater**
  - **15,000 acre-feet/yr (MAG Limited)**
  - Groundwater availability analyses utilized the Texas Water Development Board (TWDB) Central Groundwater Availability Model (GAM) for the Carrizo-Wilcox Aquifer.
  - Groundwater availability was based on an acceptable level of drawdown in the GCUWCD rules.

GBRA
Guadalupe-Blanco River Authority
flowing solutions

Conjunctive Use with ASR

- **Guadalupe River Surface Water Diversion**
  - **~27,000 acre-feet/yr**
  - New appropriation was computed subject to senior water rights and environmental flow standards adopted by the TCEQ.
  - Additionally, the environmental flow standard directs that when streamflow is between the base and subsistence flows that only 50 percent of the difference between the streamflow and the subsistence flow can be diverted.

Additional Information & Public Comment

Upon approval by Region L, TWDB requires the following additional information:

- Public comments received 14 days before and after the meeting
- Updated DB17 data to reflect all associated changes to the 2016 Region L Water Plan
- Updated Prioritization scoring/ranking
- An Addendum which includes a summary of changes (modified pages, tables, graphics in the written document)

Substitution Adoption

- GBRA requests the South Central Texas Regional Water Planning Group's positive consideration to adopt the proposed Substitution of an Alternative Water Management Strategy in the 2016 Region L Regional Water Plan, the Mid-Basin Water Supply Project — Conjunctive Use with Aquifer Storage & Recovery.

Questions?

GBRA
Guadalupe-Blanco River Authority
flowing solutions

April 12, 2017

Mr. Steve Raabe, Administrator
South Central Texas Regional Water Planning Group
c/o San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283

RE: Amendment to the 2016 Region L Plan and the 2017 State Water Plan

Dear Mr. Raabe:

The Guadalupe-Blanco River Authority (GBRA) is preparing to implement one of the evaluated water management strategies from the 2016 Region L Water Plan to serve the water supply needs in Comal, Hays, and Guadalupe Counties. GBRA intends to apply for financing utilizing the Texas Water Development Board's (TWDB) State Water Implementation Fund for Texas (SWIFT). In order to qualify for SWIFT or other state-offered financing consideration, GBRA will need to amend the 2016 Region L Plan and 2017 State Water Plan by substituting an alternative strategy in place of two recommended strategies. GBRA requests the assistance of the South Central Regional Water Planning Group and TWDB to determine the appropriate amendment type and process, and would appreciate the planning group's consideration for action to initiate an amendment at the next regularly scheduled meeting.

The proposed amendment will substitute the following two recommended strategies: 1) GBRA Mid-Basin Project (ASR) (50,000 acft) and the 2) Texas Water Alliance (TWA) Carrizo Project (MAG-Limited) (15,000 acft), with the Mid-Basin Water Supply Project (MBWSP) – Conjunctive Use with Aquifer Storage & Recovery (ASR) alternative water management strategy (42,000 acft).

The GBRA MBWSP Conjunctive Use with ASR incorporates surface water from the Guadalupe River near Gonzales with a Carrizo well field that produces groundwater and stores treated surface water. The strategy is configured to include an ASR well field that is co-located with the Carrizo well field on TWA leased property in northern Gonzales County and eastern Caldwell County. GBRA intends to purchase the affected TWA assets and will finalize the transaction prior to applying for financial assistance.

Pursuant to provisions included in Title 31, Part 10, Chapter 357, Texas Administrative Code, and upon TWDB Executive Administrator approval, GBRA believes this request may be considered a substitution since the MBWSP – Conjunctive Use with ASR alternative water management strategy is capable of meeting the same water need without over-allocating any source.

Thank you in advance for your positive consideration and attention. Please do not hesitate to contact me if you need any additional information.

Sincerely,

Kevin Patteson
General Manager/CEO

CC: Ms. Suzanne Scott, Chair
South Central Regional Water Planning Group

Regional Laboratory: 933 East Court Street ~ Seguin, Texas 78155
830-379-5822 ~ 800-413-4130 ~ 830-379-9718 fax ~ www.gbra.org

TWA
Texas Water Alliance, Limited

1399 Sattler Road
New Braunfels, Texas 78132
Phone: 830-964-2166

April 28, 2017

Mr Steve Raabe, Administrator
South Central Texas Regional Water Planning Group
c/o San Antonio River Authority
PO Box 839980
San Antonio, TX 78283

RE: Amendment to the 2016 Regional L Plan and the 2017 State Water Plan

Dear Mr. Raabe:

Recently you received a letter from the Guadalupe-Blanco River Authority (GBRA) requesting an amendment to the most recent Region L and State Water Plans in which they proposed the replacement of two recommended strategies: 1) GBRA Mid-Basin Project (ASR) (50,000 acft) and the 2) Texas Water Alliance (TWA) Carrizo Project (MAG-Limited) (15,000 acft) with the Mid-Basin Water Supply Project (MBWSP)- Conjunctive Use with Aquifer Storage & Recovery (ASR) alternative water management strategy (42,000 acft).

TWA and GBRA have worked closely over the last year to develop the most reliable and cost effective water supply project possible for Region L and believe that the MBWSP- Conjunctive Use project will provide that solution. Therefore TWA fully endorses GBRA's request for the substitution of that alternative in the Regional and State Water Plans.

Thank you for your consideration of this proposal. Please contact me directly if you need any further information.

Sincerely,

Thomas Hodge
Vice President
Texas Water Alliance

CC: Kevin Patteson, CEO of GBRA

Region L
South Central Texas Regional Water Planning Group

c/o San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

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May 16, 2017

Jeff Walker
Executive Administrator
Texas Water Development Board
P.O. Box 13231
Austin, Texas 78711

RE: Request for Approval of Proposed Substitution to the Region L 2016 Regional Water Plan

Dear Mr. Walker,

At its May 4, 2017, meeting, the South Central Texas Regional Water Planning Group (SCTRWPG) received a briefing from Kevin Patteson, General Manager at the Guadalupe-Blanco River Authority (GBRA), on a proposed substitution to the Region L 2016 Regional Water Plan. Additionally, the Planning Group authorized the San Antonio River Authority, as Administrator for the SCTRWPG, to submit a request seeking pre-adoption review and written approval from the Executive Administrator of the Texas Water Development Board (TWDB) that the proposed revision meets the definition of "substitution," as defined by the Texas Administrative Code (*see* 31 TEX. ADMIN. CODE § 357.51), or—if failing to satisfy such definition—a determination of whether the proposed revision constitutes a "minor" or "major" amendment.

Section 357.51 (e) of the Texas Administrative Code permits regional water planning groups to "substitute one or more evaluated Alternative Water Management Strategies for a recommended strategy if the strategy originally recommended is no longer recommended and the substitution of the Alternative WMS is capable of meeting the same Water Need without over-allocating any source." Additionally, section 357.51(e) requires written approval from the Executive Administrator of Texas Water Development Board prior to making the substitution." This letter serves as a request for such approval.

Specifically, GBRA requested the support of the SCTRWPG for its proposal to substitute an alternative water management strategy for two recommended water management strategies in the Region L 2016 Regional Water Plan to meet the water supply needs in Comal, Hays, and Guadalupe Counties. The 2016

Regional Water Plan includes the following two *recommended* water management strategies: 1) GBRA Mid-Basin Project (ASR) (50,000 acre-feet), and 2) Texas Water Alliance (TWA) Carrizo Project (MAG-limited) (15,000 acre-feet). The proposed *substitution* would replace both of these recommended water management strategies with the Mid-Basin Water Supply Project (MBWSP) – Conjunctive Use with Aquifer Storage & Recovery (ASR) (42,000 acre-feet). The MBWSP is currently listed as an alternative water management strategy in the Region L 2016 Regional Water Plan.

On behalf of the SCTRWPG, I hereby request written determination that the proposed substitution sufficiently meets the criteria outlined by section 357.51 (e) of the Texas Administrative Code. If the proposed substitution does not satisfy such requirements, please provide guidance as to which other type of amendment the revision constitutes (minor or major amendment). Subject to your determination, GBRA anticipates submitting the proposed substitution to the Texas Water Development Board following the next regularly scheduled Region L meeting (scheduled for August 3, 2017).

Should your office require any additional information from the Planning Group related to this request, please contact Cole Ruiz (cruiz@sara-tx.org), Steve Raabe (sraabe@sara-tx.org), or me (sscott@sara-tx.org).

Sincerely,

Suzanne Scott, Chair
San Antonio River Authority, General Manager

Cc:

Kevin Patteson, Guadalupe-Blanco River Authority, General Manager

Jonathan Stinson, Guadalupe-Blanco River Authority, Deputy General Manager

Ron Ellis, Texas Water Development Board, Regional Water Planning Project Manager

Brian Perkins, Black and Veatch, Integrated Water Supply Practice Lead

Steve Raabe, San Antonio River Authority, Director of Technical Services

Cole Ruiz, San Antonio River Authority, Intergovernmental Relations Coordinator

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

June 13, 2017

Ms. Suzanne Scott, Chair
Region L Regional Water Planning Group
P.O Box 839980
San Antonio, Texas 78283

Dear Ms. Scott:

I have reviewed Region L's May 16, 2017 request for a water management strategy substitution. Based on the request and supporting materials provided, I am approving the substitution of the alternative Guadalupe Blanco River Authority (GBRA) Mid-Basin Water Supply Project—Conjunctive Use with Aquifer Storage & Recovery (ASR) water management strategy for the recommended GBRA Mid-Basin Project—Surface Water with ASR and Texas Water Alliance Regional Carrizo Aquifer Development water management strategies.

The requested water management strategy substitution meets the requirements of 31 Texas Administrative Code §357.51(e) as the proposed recommended water management strategy is a fully-evaluated alternative water management strategy that is capable of meeting the same water needs without over-allocating any source.

If the Region L Regional Water Planning Group (RWPG) adopts the substitution, please submit written documentation of the substitution to the Texas Water Development Board (TWDB). Written documentation must include an addendum to the 2016 Region L Regional Water Plan, updated DB17 data to reflect all associated changes to the 2016 Region L Regional Water Plan, and an updated recommended project prioritization list. Within 30 days of receipt of all required information, the TWDB Executive Administrator will issue a response letter to the RWPG Chair and political subdivision acknowledging receipt of the associated documentation. If the documentation meets TWDB requirements, the TWDB Board may consider amending the 2017 State Water Plan, following a 30-day public notice and public hearing.

If you have any questions concerning this approval or its associated requirements, please contact Ron Ellis, Region L Project Manager, at 512-463-4146.

Sincerely,

Jeff Walker
Executive Administrator

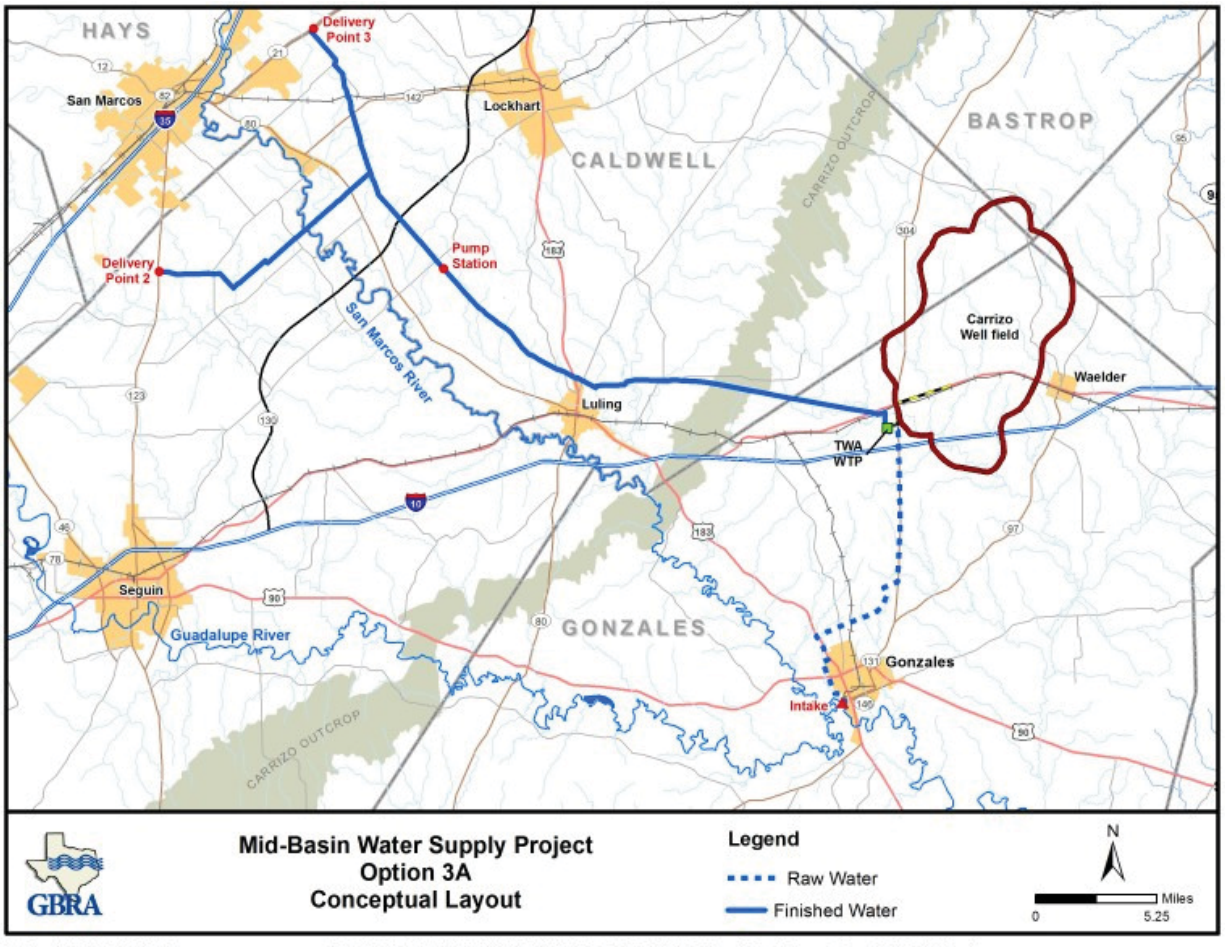
cc: Steve Raabe, San Antonio River Authority
Ron Ellis, TWDB

5.2.32 GBRA Mid-Basin Water Supply Project – Conjunctive Use with ASR

5.2.32.1 Description of Strategy

The Guadalupe-Blanco River Authority (GBRA) Mid-Basin Water Supply Project (MBWSP) Conjunctive Use with Aquifer Storage & Recovery (ASR) strategy (Option 3A) incorporates surface water from the Guadalupe River near Gonzales with a Carrizo well field that produces groundwater and stores treated surface water. The strategy is configured to include an ASR well field that is co-located with the Carrizo well field on Texas Water Alliance (TWA) leased property in northern Gonzales County and eastern Caldwell County. The overall project map is shown in Figure 5.2.32-1.

Figure 5.2.32-1 MBWSP – Conjunctive Use Conceptual Layout



Surface water from the river diversion point near Gonzales is pumped 15.3 miles to a water treatment plant (WTP) located adjacent to the Carrizo well field. Treated surface water will generally be delivered to meet daily participant needs, however, when WTP capacity exceeds daily participant needs, the excess treated water will be injected into the Carrizo using dual-purpose ASR/production wells. This WTP will also treat water

produced from the well field because the well field will generally produce a blend of raw Carrizo groundwater and treated surface water. This is necessary because the Carrizo groundwater contains iron and manganese.

Potable water supplies are conveyed to two delivery points which would include a meter and two storage tanks with sufficient capacity for 15% of average daily demand. MBWSP participants will be responsible for construction of any facilities required to connect to the delivery locations. Additionally, some treated supply could be made available to customers along the transmission line.

The total finished water pipeline route length is 45.6 miles, paralleling existing right of way for nearly 29 miles. The transmission line is sized to deliver supply at a peak rate that is 2.0 times that for uniform delivery of annual supply. Three pump stations are required to deliver supplies along the finished transmission main. A High Service Pump Station (HSPS) will pump from the clear well located at the WTP and will provide sufficient head to deliver supplies to the first booster pump station. This pump station will boost pressures to convey supplies to Delivery Point 3 and part way to Delivery Point 2. The second booster pump station will boost pressures to convey supplies to Delivery Point 2.

5.2.32.2 Available Yield

The operational concept for the MBWSP – Conjunctive Use with ASR strategy is summarized as follows: (1) when demands can be met with water rights in the Guadalupe River at Gonzales, the water is treated and delivered directly to participants; (2) when surface water supplies available from the river exceed demands and there is unused capacity in the water treatment plant and delivery system, the excess surface water is treated and stored in the Carrizo Aquifer through ASR wells; and (3) when available surface water supplies cannot meet participant demands, native groundwater or surface water previously stored in the aquifer is produced or recovered to meet the balance of the participant demands. The loss of ASR water is assumed to be zero. The introduction of ASR water adds to the volume of storage and allows for greater withdrawals to stay within GCUWCD drawdown limits. From a quantity perspective, it makes no difference whether the water withdrawn is native groundwater, finished surface water, or a blend of both.

Surface Water Modeling

Estimates of surface water available for diversion under a new appropriation from the Guadalupe River at Gonzales were computed subject to senior water rights and environmental flow standards recently adopted by the TCEQ. Surface water availability was computed in conformance with GBRA's Application No. 12378, which includes a maximum annual diversion of 75,000 acft/yr from the Guadalupe River at Gonzales and maximum instantaneous diversion rate of 500 cfs. The models used to determine availability and yield include the Guadalupe-San Antonio River Basin Water Availability Model (GSA WAM) and the Flow Regime Application Tool (FRAT).

Major modeling assumptions in applications of the GSA WAM and FRAT include:

- Water availability computed subject to full use of senior water rights for consumptive uses and environmental flow standards adopted by TCEQ on August 8, 2012.

- Treated effluent discharges were excluded throughout the river basin (similar to TCEQ Run 3), except when specifically addressed in a water right (e.g., INVISTA, Kate O'Connor Trust, etc.).
- Springflows from the Edwards Aquifer were based on aquifer management in accordance with full implementation of the Edwards Aquifer Habitat Conservation Plan (EAHCP) approved by the U.S. Fish and Wildlife Service (USFWS). Two Edwards Aquifer simulation models (GWSIM-IV for the 1934-1946 period and MODFLOW for the 1947-2000 period) were used to estimate springflow.

In order to calculate surface water available from the Guadalupe River at Gonzales for the MBWSP, a new water right (junior to all existing water rights) was modeled in the GSA WAM to obtain monthly unappropriated and regulated flows for the Guadalupe River at Gonzales. The portion of streamflow allocated to downstream senior water rights was calculated by subtracting the unappropriated flow from the regulated flow. Monthly regulated flows were then disaggregated to daily values using gaged or estimated daily streamflows for the Guadalupe River at Gonzales. Monthly amounts allocated to downstream senior water rights were then taken uniformly out of the base of the daily hydrograph such that the sum of daily pass-through amounts in each month equals the total monthly amount allocated to downstream senior water rights.

Daily senior water right pass-throughs and daily regulated flows are incorporated into the FRAT model, along with the TCEQ environmental flow standards for the Guadalupe River at Gonzales. These environmental flow standards consist of seasonal subsistence and base flows, two tiers of seasonal pulses, and a pulse exemption provision under which pulses may be excluded if the magnitude of the maximum diversion rate of the water right is less than or equal to 20 percent of the pulse peak. For example, if the maximum diversion rate for the MBWSP is 116 cfs, all small and large seasonal pulse diversion restrictions would be excluded and the MBWSP would not be required to honor those pulses. Additionally, the environmental flow standard for the Guadalupe River at Gonzales includes a provision for diversions that are made between the base flow and the subsistence flow, such that when streamflow is between the base and subsistence flows, only 50 percent of the difference between the streamflow and the subsistence flow can be diverted.

Groundwater Modeling

Groundwater availability analyses utilized the Texas Water Development Board (TWDB) Central Groundwater Availability Model (GAM) for the Carrizo-Wilcox Aquifer. Groundwater availability was based on an acceptable level of drawdown in the GCUWCD rules. The assumed maximum acceptable drawdown for the Carrizo and Wilcox aquifers in the artesian zone is 100 feet, which is measured in monitoring wells that are more than 6,000 feet from the nearest production well in the well field.

Surface Water, Groundwater, and ASR

Using monthly water availability and daily disaggregation procedures described above, an accounting model was used to simulate surface water diversions to a WTP and ASR well field as well as groundwater production from which a firm supply of treated water could be delivered to project participants. Simulations indicate that a firm yield of 42,000 acft/yr can be obtained assuming a maximum instantaneous river diversion rate and ASR

WTP capacity of 116 cfs (75 mgd) and maximum long-term drawdown in the Carrizo Aquifer near the well field on the order of 100 feet.

5.2.32.3 Environmental Issues

Environmental issues for the proposed GBRA MBWSP - Conjunctive Use with ASR project are described below. Implementation of this project would require field surveys by qualified professionals to document vegetation/habitat types, waters of the U.S. including wetlands and cultural resources that may be impacted. Where impacts to protected species habitat or significant cultural resources cannot be avoided, additional studies would be necessary to evaluate habitat use and/or value, or eligibility for inclusion in the National Register of Historic Places, respectively. Compensation would be required for unavoidable adverse impacts involving net losses of wetlands.

The GBRA MBWSP- Conjunctive Use with ASR water management strategy involves the construction of an intake on the Guadalupe River with a raw water transmission pipeline to the new TWA WTP site, a well field in Gonzales County, a raw water transmission pipeline from the well field to the TWA WTP, a potable water pipeline to a delivery point near San Marcos through Luling with an additional booster pump station, and a potable water pipeline section to a delivery point near Seguin. The pipelines traverse both the Blackland Prairie and Post Oak Savannah ecoregions[1] and are within the Texan biotic province[2]. Vegetation within the project area is dominated by a mosaic of post oak woods, forest, and grassland to the east and cropland along the western portion of the pipeline.

The Guadalupe River intake has the potential for localized negative ecological impacts as the site area consists of over 90% riparian woodland. Riparian woodlands, especially those located within floodplains, are ecological features that contribute to the natural and traditional character of waterways. These areas help protect water quality, wildlife habitat, and aquatic resource functions and services. However, the well field, transmission pipelines and the TWA WTP site are anticipated to have a low negative impact to terrestrial habitat. Approximately 60-80% of these areas occur within grassland, cropland and disturbed areas. Any remaining habitat which includes woody species within these areas has been highly fragmented by existing land uses and disturbances including roads, utility rights-of-way and cropland. Outside the maintained right-of-way, land use would not be anticipated to change due to pipeline construction. Herbaceous habitats would recover fastest from impacts and would experience low negative impacts. Impacts to woody vegetation would be permanent due to pipeline and WTP maintenance. The proposed well field would have a minimal impact on vegetation within the project area due to limited surface exposure.

The transmission pipelines and water treatment plant site are anticipated to have minimal impact on existing terrestrial habitat. Many pipeline segments are co-located along existing rights-of-way, fencerows, and other disturbances, which would reduce their overall vegetative impact. Pipelines, including collection, raw, and finished water transmission, would require multiple crossing of roads, railroads, and other utilities, as well as being in close proximity to structures, but no adverse effects are expected. The

[1] Gould, F.W. 1975. The Grasses of Texas. Texas A&M University Press. College Station, Texas.
[2] Blair, W.F., "The Biotic Provinces of Texas, "Tex. J. Sci. 2:93-117, 1950.

TWA WTP is located on undeveloped grassland. Impacts to land use would be limited to the removal of existing vegetation and temporary impacts during construction.

With numerous miles of raw and finished water pipelines, crossings of many jurisdictional waters would occur. Intermittent waters, which in this area primarily include streams and impoundments, would occur frequently and make up the majority of the jurisdictional areas crossed. Major intermittent waters potentially affected by this strategy include Buck, Crooked, and Salt branches; Callihan, Cottonwood, Dickerson, Kerr, Long, McNeil, Morrison, Seals, and West Fork Plum creeks; Dry Run; and Sandy Fork. Impacts from pipelines to these waters are anticipated to be minor, would be restorable and temporary, and occur during construction.

Perennial waters are less commonly encountered in the project area and include the Guadalupe River (intake), San Marcos River, Artesia Creek, Mule Creek and Plum Creek. Avoidance and minimization measures, such as horizontal directional drilling, construction best management practices (BMPs), and avoiding perennial and /or sensitive aquatic habitats (e.g., the San Marcos River, Plum Creek, etc.) would reduce the potential impacts from pipelines.

The TCEQ 2010 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d) lists Sandy Fork as a Category 5b water body. This listing indicates Sandy Fork is impaired because it “does not meet applicable water quality standards or is threatened for one” and “a review of the water quality standards for this water body will be conducted before a Total Maximum Daily Load (TMDL) is scheduled.” Bacteria levels are the parameter on which TCEQ bases this designation. The designation applies to TCEQ Segment ID 1803G_01, which occurs from the confluence with Peach Creek up to the confluence with Scruggs Creek (NHD Reach Code 12100202021868). The raw water transmission line from the well field to the TWA WTP site and the finished water transmission pipeline both cross this designated segment, but the potential negative impact is anticipated to be negligible. Impacts from construction of these project components would be temporary and available avoidance and minimization practices could further reduce potential impacts. The TWA WTP site has limited potential water body impact with one small, potentially jurisdictional ephemeral stream located on the site.

The surface water intake is located along the Guadalupe River within a flood hazard area, and would require the placing of structures and fill material into the river. Impacts resulting from this action would include possible localized impacts to the riparian buffer, bank condition, and possibly instream habitat depending on the final intake design. However the intake is not expected to have an adverse effect on the river’s overall chemical, physical, or biological functions, such as water/sediment transport, access to floodplains, water supply, habitat, and recreation. The WTP site and wells are not located within flood hazard areas.

Coordination with the U.S. Army Corps of Engineers would be required for construction within waters of the U.S. Impacts from this proposed project resulting in a loss of less than 0.5 acres of waters of the U.S. could be covered under Nationwide Permit #12 for Utility Line Activities unless there are significant impacts to the aquatic environment by other project components.

The Texas Parks & Wildlife Department (TPWD) has identified a number of stream segments throughout the state as ecologically significant on the basis of biological function, hydrologic function, riparian conservation, exceptional aquatic life uses, and/or threatened or endangered species. Currently, 21 stream segments in Region L are considered ecologically significant by the TPWD[3]. Pipelines associated with this water management strategy do not cross any of these stream segments. The section of the Guadalupe River from U.S. 183 (near the Gonzales diversion point) upstream to Lake Gonzales Dam, however, is listed as ecologically significant as it contains two of four known remaining populations of the golden orb, a rare, endemic mollusk.

Cultural resources protection on public lands in Texas is afforded by the Antiquities Code of Texas (Title 9, Chapter 191, Texas Natural Resource Code of 1977), the National Historic Preservation Act (Pl96-515), and the Archeological and Historic Preservation Act (PL93-291). Based on the review of available GIS datasets, there are ten cemeteries, five national register properties, two national district properties, and 42 historical markers located within a 0.5-mile buffer of the proposed pipeline route. Additionally, there are seven cemeteries and four historical markers within the potential well field area.

Based on a review of soils, geology, and aerial photographs, there is a high probability for undocumented significant cultural resources within the alluvial deposits and terrace formations associated with waterways, specifically the intermittent and perennial aquatic resources. The intake has a high potential impact for cultural resources, primarily due to its location in an area with known cultural resources within one-half mile. The well field collection and transmission pipelines potentially are considered to have low negative impact to cultural resources. For the most part, the pipelines would cross areas of low probability for cultural resources, but those probabilities increase near waterways and associated landforms. However, Thompsonville cemetery is located in the well field near proposed collection piping. The WTP site and wells potentially have negligible negative impacts. No known cultural resource sites occur within these areas, but these components are sited in low probability areas.

A review of archaeological resources in the proposed project area should be conducted during the project planning phase. Taking into consideration that the owner or controller of the project will likely be a political subdivision of the State of Texas (i.e. river authority, municipality, county, etc.), they will be required to coordinate with the Texas Historical Commission regarding impacts to cultural resources. The project sponsor will also be required to coordinate with the U.S. Army Corps of Engineers regarding any impacts to waters of the United States or wetlands.

The species listed by USFWS, and TPWD, as endangered or threatened with potential habitat in Gonzales, Caldwell, and Guadalupe counties are listed in Table 5.2.32-1. The Texas Natural Diversity Database, maintained by TPWD, which documents the occurrence of rare species within the state was included in this analysis. Available data did not reveal the occurrence of any listed species within the project area, but the absence of data does not imply the absence of occurrence. Depending on the final design of the intake and resulting impacts to instream habitat, this portion of the project includes potential impacts to federal-candidate/state-listed mollusks and the Cagle's map

[3] TPWD, "Ecologically Significant River and Stream Segments," http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/sigsegs/index.phtml accessed February 6, 2014.

turtle based on known occurrences of these species near the intake site. The well field, pipelines, and WTP site include limited potential impacts to listed species.

Table 5.2.32-1 Endangered, Threatened, and Species of Concern for Caldwell, Gonzales, and Guadalupe Counties

Common Name	Scientific Name	Impact Value	Multiplier Based on Status	Adjusted Impact	Summary of Habitat Preference	USFWS Listing	TPWD Listing	Potential Occurrence in County
BIRDS								
American peregrine falcon	*Falco peregrinus anatum*	0	2	0	Migrant and local breeder in West Texas.	DL	T	Possible Migrant
Artic peregrine falcon	*Falco peregrinus tundrius*	0	1	0	Migrant throughout the state.	DL		Possible Migrant
Bald eagle	*Haliaeetus leucocephalus*	0	2	0	Found primarily near rivers and large lakes.	DL	T	Possible Migrant
Henslow's sparrow	*Ammodramus henslowii*	1	1	1	Found in weedy fields or cut-over areas			Resident
Interior least tern	*Sterna antillarum athalassos*	0	3	0	Nests along sand and gravel bars in braided streams	LE	E	Resident
Mountain plover	*Charadrius montanus*	1	1	1	Non-breeding, shortgrass plains and fields			Nesting/ Migrant
Sprague's pipit	*Anthus spragueii*	0	1	0	Migrant in Texas in winter mid Sept. to early April. Strongly tied to native upland prairie.			Possible Migrant
Western burrowing owl	*Athene cunicularia hypugaea*	1	1	1	Open grasslands, especially prairie, plains and savanna			Resident
Whooping crane	*Grus americana*	0	3	0	Potential migrant	LE	E	Potential Migrant
Wood stork	*Mycteria americana*	1	2	2	Forages in prairie ponds, ditches, and shallow standing water formerly nested in TX		T	Migrant
FISHES								
Blue sucker	*Cycleptus elongatus*	1	2	2	Major rivers in Texas.		T	Resident
Guadalupe bass	*Micropterus treculi*	1	1	1	Endemic to perennial streams of the Edwards Plateau region.			Resident
Guadalupe darter	*Percina sciera apristis*	1	1	1	Guadalupe River Basin. Usually found over gravel or gravel and sand raceways of larger streams and rivers.			Resident

Common Name	Scientific Name	Impact Value	Multiplier Based on Status	Adjusted Impact	Summary of Habitat Preference	USFWS Listing	TPWD Listing	Potential Occurrence in County
INSECTS								
A mayfly	*Campsurus decolaratus*	0	1	0	In Texas and Mexico, possibly clay substrates, found in shoreline vegetation.			Potential Resident
MAMMALS								
Cave myotis bat	*Myotis velifer*	0	1	0	Roosts colonially in caves, rock crevices			Resident
Plains spotted skunk	*Spilogale putorius interrupta*	1	1	1	Prefers wooded, brushy areas.			Resident
Red wolf	*Canis rufus*	0	3	0	Extirpated.	LE	E	Historic Resident
MOLLUSKS								
Creeper (squawfoot)	*Strophitus undulates*	1	1	1	Small to large streams. Colorado, Guadalupe, and San Antonio River basins.			Resident
False spike mussel	*Quincuncina mitchelli*	1	2	2	Substrates of cobble and mud. Rio Grande, Brazos, Colorado and Guadalupe river basins.		T	Resident
Golden orb	*Quadrula aurea*	1	2	2	Sand and gravel, Guadalupe, San Antonio, Lower San Marcos, and Nueces River basins	C	T	Resident
Palmetto pill snail	*Euchemostrema leai cheatumi*	0	1	0	Known only from Palmetto State Park.			Resident
Texas fatmucket	*Lampsilis bracteata*	1	2	2	Streams and rivers on sand, mud and gravel, Colorado and Guadalupe River basins.	C	T	Resident
Texas pimpleback	*Quadrula petrina*	1	2	2	Mud, gravel and sand substrates, Colorado and Guadalupe river basins		T	Resident
PLANTS								
Big red sage	*Salvia pentstemonoides*	0	1	0	Texas endemic, found in moist to seasonally wet steep limestone outcrops on canyons or along creek banks.			Resident

Common Name	Scientific Name	Impact Value	Multiplier Based on Status	Adjusted Impact	Summary of Habitat Preference	USFWS Listing	TPWD Listing	Potential Occurrence in County
Bristle nailwort	*Paronychia setacea*	1	1	1	Endemic to south central Texas in sandy soils.			Resident
Buckley's spiderwort	*Tradescantia buckleyi*	1	1	1	Endemic in grassland openings in oak woodlands.			Resident
Green beebalm	*Monarda viridissima*	1	1	1	Endemic perennial herb. Found in well-drained sandy soils in opening of post oak woodlands.			Resident
Elmendorf's onion	*Allium elmendorfii*	1	1	1	Endemic, in deep sands			Resident
Parks' jointweed	*Polygonella parksii*	0	1	0	Texas endemic, primarily found on deep, loose, sand blowouts in Post Oak Savannas.			Resident
Shinner's sunflower	*Helianthus occidentalis ssp.*	1	1	1	Found on prairies on the Coastal Plain.			Resident
Sandhill woolywhite	*Hymenopappus carrizoanus*	1	1	1	Found south of the Guadalupe River. Prefers dense riparian corridors.			Resident
REPTILES								
Cagle's map turtle	*Graptemys caglei*	1	2	2	Endemic to Guadalupe River System. Found near waters' edge.		T	Resident
Spot-tailed earless lizard	*Holbrookia lacerata*	1	1	1	Moderately open prairie-brushland.			Resident
Texas Garter Snake	*Thamnophis sirtalis annectens*	1	1	1	Wet or moist microhabitats			Resident
Texas Horned Lizard	*Phrynosoma cornutum*	1	2	2	Varied, sparsely vegetated uplands.		T	Resident
Texas Tortoise	*Gopherus berlandieri*	1	2	2	Open brush w/ grass understory.		T	Resident
Timber/ canebrake rattlesnake	*Crotalus horridus*	1	2	2	Floodplains, upland pine, deciduous woodlands, riparian zones.		T	Resident

TPWD, 2014. Annotated County List of Rare Species – Gonzales, Guadalupe and Caldwell County revised 8/7/2012.

USFWS, 2013. Endangered Species List for Texas. http://www.fws.gov/southwest/es/ES_ListSpecies.cfm accessed online February 6, 2013.

The project area may provide potential habitat to endangered or threatened species found in Gonzales, Caldwell, or Guadalupe counties. A survey of the project area may

be required prior to pipeline and well field construction to determine whether populations of or potential habitats used by listed species occur in the area to be affected. Coordination with TPWD and USFWS regarding threatened and endangered species with the potential to occur in the project area should be initiated early in project planning.

Based on existing habitat types, the following species have potential to occur near project components. The aquatic species are only of concern at river intake or locations where pipelines cross perennial waters.

A. Federal-Listed Endangered Species

Whooping Crane (Grus americana) — The Whooping Crane is a federally listed species which would occur in Texas only during migration. Whooping cranes use a variety of habitats during migration, including croplands for feeding and large, marshy palustrine wetlands for roosting. Although large wetlands do not exist within the project area, the Whooping Crane could potentially occur in any surrounding cropland habitat during migration.

B. Federal-Listed Candidate Species

Golden Orb (Quadrula aurea) — The Golden orb is a federal candidate for listing and is state threatened. This freshwater mollusk exists in sand, gravel or mud substrates within lake or river systems. The TPWD designates a segment of the Guadalupe River near the intake as an Ecologically Significant Stream Segment based on the occurrence of the golden orb. This species was collected during a fall 2011 survey near Gonzales and could potentially occur in perennial streams, like the Guadalupe River, and near the proposed surface water intake.

Texas fatmucket (Lampsilis bracteata) — The Texas fatmucket is a federal candidate for listing in the state and is state threatened. This freshwater mollusk exists in more shallow rivers or streams with substrates of sand, mud and gravel. This species could potentially occur in perennial streams, like the Guadalupe River, and near the proposed surface water intake.

Texas pimpleback (Quadrula petrina) — The Texas pimpleback is a federal candidate for listing in the state, but not in Gonzales and Caldwell counties, and is state threatened. This freshwater mollusk exists in small to moderate streams and rivers of slow flow rates, as well as moderate size reservoirs with substrates of mixed mud, sand and fine gravel. This species was collected during a fall 2011 survey near Gonzales, Texas and could potentially occur in perennial streams, like the Guadalupe River, and near the proposed surface water intake.

C. State-Listed Species

Bald Eagle (Haliaeetus leucocephalus) — The Bald Eagle is a state-listed threatened species that could occur as a migrant near major aquatic resources. Although they breed primarily in the eastern half of the state, they could potentially occur along rivers or large lakes in this region of Texas during the winter and during migration. This species could potentially occur near perennial waterways.

Interior Least Tern (Sterna antillarum athalassos) — The Interior Least Tern is listed as endangered by the USFWS. They prefer to nest on sandbars, islands, salt flats, and bare or sparsely vegetated sand, shell, and gravel beaches that are associated with braided

streams, rivers and reservoirs. They could potentially occur within these habitats along the San Marcos River, Plum Creek, Salt Branch, or dry, exposed impoundments.

Peregrine Falcon (Falco peregrinus), including the American peregrine falcon (F. p. anatum) subspecies, is a state threatened bird that could be a possible migrant. They utilize a wide range of habitats during migration, including urban areas and landscape edges such as lakes or large river shores.

Blue sucker (Cycleptus elongatus) is a state threatened fish and exists in large portions of major rivers in Texas. Their preferred habitat includes channels and flowing pools with a moderate current and a bottom of exposed bedrock with hard clay, sand and gravel components.

False spike mussel (Quadrula mitchelli) is state threatened freshwater mollusk. The TPWD county list states the species as possibly extirpated in Texas. This species was collected during a fall 2011 survey near Gonzales, Texas and could potentially occur in perennial streams, like the Guadalupe River, and near the proposed surface water intake.

Cagle's map turtle (Graptemys caglei) is a state threatened reptile and occupies riverine habitat in the Guadalupe-San Antonio river systems. They prefer shallow water with swift to moderate flow and a substrate of gravel or cobble or deeper pools with a slower flow rate and a substrate of silt or mud. This turtle will nest on gently sloping sand banks along rivers. The NDD depicts an approximately 5 mile stretch of recorded Cagle's map turtle observations downstream of the Gonzales Dam, near the intake. This species could potentially occur in perennial waterways.

Texas horned lizard (Phrynosoma cornutum) is a state threatened reptile and is present throughout much of the state. They exist in open, arid, and semi-arid regions with sparse vegetation, which includes grass, cactus, scattered brush or scrubby trees. This species could potentially occur in areas with this type of contiguous vegetation.

Texas tortoise (Gopherus berlandieri) is a state threatened reptile that is active in the warmer months of March through November. They occur in open brush with a grass understory and will avoid areas of open grass or bare ground. This species could potentially occur in areas with this type of contiguous vegetation.

Timber/Canebrake rattlesnake (Crotalus horridus) is a state threatened reptile that occurs in swamps, floodplains, upland pine and deciduous woodlands, riparian zones, and abandoned farmland. They could also be present in limestone bluffs, sandy soil or black clay. This species could potentially occur in areas of abandoned farmland or forested riparian areas.

D. Unique or Rare Species

American eel (Anguilla rostrata) is not a listed species, but is part of a unique community designation within the San Marcos River. The NDD has no recorded occurrences of this species in the location of the proposed assessment area, but the species could potentially occur in perennial streams.

Guadalupe bass (Micropterus treculii) is an endemic game fish to Texas, found in the northern and eastern Edwards Plateau including headwaters of the San Antonio River, the Guadalupe River above Gonzales, the Colorado River north of Austin, and portions

of the Brazos River drainage. Relatively small populations occur outside of the Edwards Plateau, primarily in the lower Colorado River. Although not a listed species, it is the official state fish and considered rare by TPWD. This species could potentially occur in perennial waters.

The primary impacts that would result from construction of the proposed project would include the conversion of existing habitats and land uses within the pipeline right-of-way, WTP site, and well sites to maintained areas. These impacts are anticipated to be minor. The surface water intake would require the placing of structures and fill material into the river which may result in possible localized impacts to the riparian buffer, bank condition, and possibly instream habitat depending on the final intake design.

5.2.32.4 Engineering and Costing

Costs are based on the GBRA's MBWSP Engineering Feasibility Study (Option 3A) and indexed to September 2013 prices and other TWDB costing assumptions. The project is sized for 42,000 acft/yr annual delivery with a 2.0 peaking factor. Total project and annual costs for this option at the stated project yield are included in Table 5.2.32-2.These costs are for all facilities including raw water intake and pump station, raw water delivery pipelines, well field facilities, treatment plant, and potable water facilities up to the customer delivery points (i.e. everything shown in Figure 5.2.32-1). Costs for engineering, legal, and contingencies are estimated as 30 percent of capital costs for the pipeline and 35 percent of capital costs for other facilities (e.g., pump stations). Interest during construction was calculated based on a 3 percent differential between loan payments and earnings with a 2.5 year construction period. The capital costs for all facilities are $462,962,000 (Table 5.2.32-2).

Adding in non-capital costs: engineering/legal /contingencies, environmental, land acquisition and surveying, interest during construction, and groundwater lease payments; the total project costs for all facilities required to provide a firm annual supply of 42,000 acft/yr are $700,897,000. Annual costs which include debt service (5.5%, 20 years), operation and maintenance, and energy costs are $77,054,000, resulting in annual unit costs of $1,835/acft.

In terms of environmental impacts, the amount and type of impact drives potential surveying, permitting, and mitigation costs. Implementing measures to avoid and limit impacts (e.g., horizontal directional drilling) to sensitive environmental features and aquatic resources may lessen potential costs. Potential environmental and archaeological costs (surveying, permitting, and mitigation) are estimated at $1,064,000.

Table 5.2.32-2 Summary Cost Estimate for GBRA MBWSP- Conjunctive Use with ASR

Item	*Estimated Costs for Facilities*
Intake Pump Stations	$16,348,000
Transmission Pipeline	$115,443,000
Transmission Pump Station(s) & Storage Tank(s)	$23,277,000
Well Fields (Wells, Pumps, and Piping)	$87,097,000
Storage Tanks (Other Than at Booster Pump Stations)	$3,675,000
Water Treatment Plant	$212,959,000
Access Roads	$4,163,000
TOTAL COST OF FACILITIES	**$462,962,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$156,684,000
Environmental & Archaeology Studies and Mitigation	$1,064,000
Land Acquisition and Surveying	$9,073,000
Interest During Construction (4% for 2.5 years with a 1% ROI)	$55,070,000
Advanced Payments for Groundwater Leases	$16,044,000
TOTAL COST OF PROJECT	**$700,897,000**
ANNUAL COST	
Debt Service (5.5 percent, 20 years)	$58,615,000
Operation and Maintenance	
Intake, Pipeline, Pump Station & Groundwater	$4,841,000
Water Treatment Plant (2.5% of Cost of Facilities)	$9,418,000
Pumping Energy Costs (46,441,667 kW-hr @ 0.09 $/kW-hr)	$4,180,000
TOTAL ANNUAL COST	**$77,054,000**
Available Project Yield (acft/yr), based on a Peaking Factor of 2	42,000
Annual Cost of Water ($ per acft)	$1,835
Annual Cost of Water ($ per 1,000 gallons)	$5.63

Note: Unit costs for Option 3A in GBRAs MBWSP Engineering Feasibility Study were estimated at $1635/acft using March 2012 prices, debt service at 5% for 30 years, and $0.12/kwhr.

5.2.32.5 Implementation Issues

For each aquifer in the region, the GCDs have adopted desired future conditions (DFCs). In some GCDs, full use of all groundwater supplies (permitted, grandfathered and exempt) may result in non-achievement of the DFCs for an aquifer. To ensure consistency with the DFCs, TWDB currently requires that groundwater availability for each aquifer be limited for planning purposes to the modeled available groundwater (MAG) for the aquifer. This has resulted, for planning purposes only, in adjustments to permit amounts, and a lack of firm water available for future permits in this plan for some areas for certain time periods. This should not be construed as recommending or requiring that GCDs make these adjustments, or deny future permit applications. SCTRWPG recognizes and supports the ability of permit holders to exercise their rights to groundwater use in accordance with their permits and it recognizes and supports the GCDs discretion to issue permits and grandfather historical users for amounts in excess of the MAG. SCTRWPG may not modify groundwater permits that GCDs have already issued or limit future permits that GCDs may issue. If the MAG is increased during or after this planning cycle, SCTRWPG may amend this Plan to adjust groundwater supply numbers that are affected by the new MAG amount.

Significant implementation issues for the project include TCEQ approval of GBRA's surface water diversion permit application and modifications of or variances to rules from the Gonzales County Underground Water Conservation District (GCUWCD) including:

a. Allowing the maximum production of a well to exceed the average annual production by a factor of 2.0 instead of 1.5; and

b. Modify contiguous acreage requirements to be based on long-term average annual well field production instead of the maximum annual permitted capacity; and

c. Granting recharge credit for injected water through ASR operations; these credits would be used to increase the allowable groundwater production from given leases.

Other implementation issues include:

a. Whether an agreement can be reached with TWA to acquire their groundwater leases;

b. Renewal of GCUWCD 5-year production permits and 30-year export permits for project life;

c. Additional groundwater development in the region will not have a substantial effect on groundwater levels in the well field areas;

d. A test drilling program is recommended during a Pre-Design Phase to confirm aquifer properties and support designs of the wells;

In addition it will be necessary to obtain the following permits and agreements:

e. USACE Sections 10 and 404 Dredge and Fill Permits for the reservoir and pipelines;

f. GLO Sand and Gravel Removal permits;

g. GLO Easement for use of state-owned land;

h. TPWD Sand, Gravel, and Marl permit; and

i. Private land for construction of facilities to be acquired through either negotiations or condemnation.

Permitting may require development of habitat mitigation plan, environmental studies, and/or cultural resources studies and mitigation.

8. 2021 Plan Enhancement Process: Recap of Guiding Principles Previously Discussed and Adopted

2021 Plan Enhancement Process Schedule

May 2016	The appropriateness and adequacy of how demand and need are determined.	**Discussed**: May 5, 2016 **Adopted**: August 4, 2016	**Guiding Principle Adopted**
	The role of regional water planning groups in influencing population growth and land use.	**Discussed**: May 5, 2016 **Adopted**: August 4, 2016	**Guiding Principle Adopted**
	Defining conflicts of interests of planning group members	**Discussed**: May 5, 2016 **Adopted**: August 4, 2016	**Guiding Principle Adopted**
August 2016	The role of regional water planning groups in influencing water development plans of water suppliers.	**Discussed**: August 4, 2016 **Adopted**: Nov. 3, 2016	**Guiding Principle Adopted**
	The role of regional water planning groups in influencing permitting entities.	**Discussed**: August 4, 2016 **Adopted**: Nov. 3, 2016	**Guiding Principle Adopted**
November 2016	The adequacy of evaluating the Plan's effects on freshwater inflows to San Antonio Bay.	**Discussed**: Nov. 3, 2016 **Adopted**:	**Assigned to Environmental Assessment Workgroup**
	The adequacy of environmental assessments of individual WMS's.	**Discussed**: Nov. 3, 2016 **Adopted**:	**Assigned to Environmental Assessment Workgroup**
February 2017	How Water Management Strategies are categorized; e.g. Recommended, Alternate, Needing Further Study.	**Discussed**: Feb 2, 2017 **Adopted**:	**Assigned to Minimum Standards Workgroup**
	Establishing Minimum standards for Water Management Strategies included in the Plan	**Discussed**: Feb 2, 2017 **Adopted**:	**Assigned to Minimum Standards Workgroup**
	Maintaining management supply while avoiding "over planning".	**Discussed**: Feb 2, 2017 **Adopted**:	**Assigned to Minimum Standards Workgroup**
May 2017	Identifying special studies or evaluations deemed important to enhance the 2021 Plan and identification of outside funding sources.	**Discussed**: May 5, 2017 **Adopted**:	***To be discussed at August 2017 Meeting**
	Address the role of reuse within the regional water plan.	**Discussed**: May 5, 2017 **Adopted**:	***To be discussed at August 2017 Meeting**
	The extent to which innovative strategies should be used.	**Discussed:** May 5, 2017 **Adopted:**	***To be discussed at August 2017 Meeting**

South Central Texas Regional Water Planning Group

2021 Regional Water Plan Enhancement Process Guiding Principles

Appropriateness and Adequacy of How Demand and Need are Determined

Guiding Principle:
Discussed at SCTRWPG meeting on May 5, 2016, Adopted on August 4, 2016
The South Central Texas Regional Water Planning Group (SCTRWPG) generally defers to the Texas Water Development Board (TWDB) on matters related to population and water demand projections. However, the SCTRWPG retains the duty to review TWDB projections on a case by case basis. Where the SCTRWPG finds a discrepancy in TWDB's projections, and can adequately justify its findings by verifying one or more of the "criteria for adjustment," TWDB – in consultation with Texas Department of Agriculture, Texas Commission on Environmental Quality, and Texas Parks and Wildlife Department – may adjust population and/or water demand projections accordingly (see generally *General Guidelines for Fifth Cycle of Regional Water Plan Development*, Article 2. *Population and Water Demand Projections*). Consistent with Chapter 8 of the 2016 Regional Water Plan for Region L, the SCTRWPG supports greater TWDB flexibility through relaxation of current methodological assumptions holding regional and state population projection totals fixed (see Chapter 8.9.3 *Population and Water Demand Projections)*. Water demand projections used in developing the Regional Water Plan should be consensus figures arrived at by using TWDB data along with local input from the cities, counties, and groundwater districts.

Role of Regional Water Planning Groups in Influencing Population Growth and Land Use

Guiding Principle:
Discussed at SCTRWPG meeting on May 5, 2016, Adopted August 4, 2016
Where the concepts of population growth and land use necessarily interrelate with the Regional Water Plan, the SCTRWPG shall, to the greatest extent possible, develop strategies to meet future projected demands. However, it is neither the role, nor the responsibility of the SCTRWPG to influence population growth or land use. While the SCTRWPG has a duty to remain cognizant of the sensitive relationship between the Regional Water Plan, population growth and land use, decisions concerning permitting and influencing population growth are inherently local, and remain wholly independent from the regional water planning process.

Conflicts of Interests With Respect to Planning Group Members

Guiding Principle:
Discussed at SCTRWPG meeting on May 5, 2016, Adopted August 4, 2016

1. Active Planning Group Members

All disclosures pursuant to Article V, Section 6 of the SCTRWPG Bylaws, are the responsibility of the planning group member or designated alternate who has the potential conflict of interest. Therefore, disclosures are the responsibility of the planning group member or designated alternate. If the voting member choses to abstain from participation in deliberations, decisions, or voting, pursuant to Article V, Section 6 of the SCTRWPG Bylaws, the reason for abstention shall be noted in the minutes.

SCTRWPG Bylaw Excerpt

> Potential conflicts of interest shall be clearly stated by the voting member or designated alternate prior to any deliberation or action on an agenda item with which the joint member or designated alternate may be in conflict. Where the potential conflict is restricted to a divisible portion of an agenda item, the Chair may divide the agenda item into parts for deliberation and voting purpose. An abstention from participation in deliberations, decisions or voting and the reason therefore shall be noted in the minutes.

(see *SCTRWPG Bylaws*, Article V, Section 6, (b))

2. Nomination Process

Where the SCTRWPG is soliciting nominations to fill vacancies on the planning group, nominators shall provide information regarding the nominee's current employer, and provide a description of the nominee's experience that qualifies him/her for the position in the interest group being sought to represent.

Additionally, nominees shall agree to abide by the Code of Conduct, which is incorporated in the SCTRWPG Bylaws (see *SCTRWPG Bylaws*, Article V, Section 6). As per the Bylaws, the Executive Committee will conduct an interview process whereby nominees will be evaluated. Prior to the interview, nominees will be provided a copy of the Bylaws. During the interview process, nominees will be asked if they are willing to agree to to the Bylaws, and specifically, if they are willing to comply with the Code of Conduct.

The Role of the Planning Group in Influencing Water Development Plans of Water Suppliers

Guiding Principle:
Discussed at SCTRWPG meeting on August 4, 2016, Adopted: November 3, 2016

The role of the SCTRWPG is to ensure water needs are met with identified potentially feasible water management strategies. It is not the role of the SCTRWPG to influence or interfere with local water planning decisions. In the absence of a planning group recommended potentially feasible water management strategy to meet an identified need, the SCTRWPG may evaluate and report, as required, the social, environmental and economic impacts of not meeting the identified need.

The Role of the Planning Group in Influencing Permitting Entities

Guiding Principle:
Discussed at SCTRWPG meeting on August 4, 2016, Adopted: November 3, 2016

Decisions made at the planning group level are non-regulatory, and are intended for planning purposes only. While some decisions made by the SCTRWPG could inevitably affect some decisions made by the governing boards of permitting entities, it is neither the responsibility, nor the role of the SCTRWPG to influence or interfere with the regulatory decisions made by the governing boards of permitting entities.

The adequacy of evaluating the Plan's effects on freshwater inflows to San Antonio Bay.
And
The adequacy of environmental assessments of individual WMS's.

Guiding Principle:
Discussed at SCTRWPG meeting on November 3, 2016, Adopted: February 2, 2017

The SCTRWPG's evaluation of its plan's effects on the instream effects and freshwater inflows to the San Antonio Bay, and its environmental assessments of individual water management strategies are currently meeting the regulations and statutes for regional water planning. It is the SCTRWPG's intent to create a workgroup to evaluate the current methodologies and whether additional or alternative environmental assessment of instream effects and freshwater inflows into the San Antonio Bay, and of individual water management strategies, are necessary. If additional or alternative methodologies are recommended, the workgroup shall identify what costs would be associated with the additional evaluation and how these costs would be covered. The Workgroup will report back to the full SCTRWPG on any recommendations it may have.

9. Discussion and Appropriate Action Regarding the Adoption of the Environmental Assessment Workgroup’s Recommendations on the Following Components of the 2021 Plan Enhancement Process:
    a. The Adequacy Of Evaluating the Plan's Effects on Freshwater Inflows to San Antonio Bay
    b. The Adequacy of Environmental Assessments Of Individual Water Management Strategies

Environmental Assessment Workgroup Recommendations to Region L Planning Group

Steven Siebert
Chair/ Environmental Assessment Workgroup

August 3, 2017

Region L Planning Group Meeting

Environmental Assessment Workgroup

Workgroup Goal

- This Workgroup is tasked with evaluating current methodologies, and determining if additional or alternative environmental assessments of instream effects and freshwater inflows into the San Antonio Bay, and of individual water management strategies, are necessary.
- If such additional or alternative methodologies are recommended, this Workgroup will identify what costs would be associated with the additional/alternative evaluation and how these costs would be covered.

Environmental Assessment Workgroup

Workgroup Participants

Charlie Flatten
Patrick Garcia
Tommy Hill
Kevin Janak
Marty Kelly
Con Mims
Graham Moore
Iliana Peña
Humberto Ramos
Steven Siebert
Jonathan Stinson
Darren Thompson
Dianne Wassenich

Support Staff

Jenna Cantwell
Ron Ellis
Temple McKinnon
Brian Perkins
Steve Raabe
Cole Ruiz
Christine Westerman

Environmental Assessment Workgroup

Evaluative Principles

- Structure
  - How is the environmental assessment data being presented in the Region L Plan
- Realism
  - The Plan should reflect realistic environmental impacts of the recommended water management strategies
- Realism and Structure reflect how a reworking of data presented would benefit the understanding of environmental assessments within the Region L Plan

Environmental Assessment Workgroup

Recommendations – No additional Assessments

Charge #1

Are additional or alternative environmental assessments of instream effects and freshwater inflows in to the San Antonio Bay needed?

- No recommendations for additional or alternative assessments

Charge #2

Are additional or alternative environmental assessments of individual water management strategies needed?

- No recommendations for additional or alternative assessments

Environmental Assessment Workgroup

Recommendations – Plan Reorganization

Threatened and Endangered Species

- Consolidate T&E species information in appendix and eliminate duplicative data in each WMS write-up
- Reference appendix in each WMS write-up
- Create a cross reference table of species versus type of project: reservoir, pipeline well field etc.

•Photo Credit: Audubon. Black-capped vireo

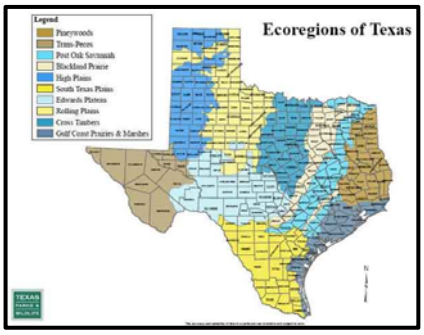
•Photo Credit: TPWD. Texas Horned Lizard

Environmental Assessment Workgroup

Recommendations

Water Management Strategy Evaluations

- Potential Impacts to Vegetation and Terrestrial Habitat from WMS
  - Update baseline data from 1984 to most current
  - No additional cost
- Potential Impacts to Cultural Resources from WMS
  - Adjust distances for cemeteries, significant historical sites, review archaeological site information
    - GIS based
  - No additional cost



Environmental Assessment Workgroup

Recommendations

Administrative Recommendations - No additional cost

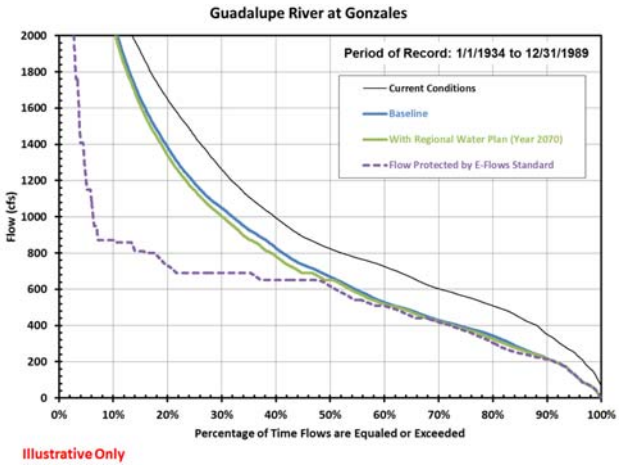
- Include high level write-up of climate variability for Planning Group member review and comment
- Eliminate Environmental Assessment comparisons of current plan to past plans
- Initiate Environmental Assessments earlier into the regional planning process
- Chapter 8 Policy Workgroup to consider recommendation for consistency in the regional planning process
  - TWDB could be more prescriptive in how Environmental Assessments are organized and presented in the Plans

Environmental Assessment Workgroup

Recommendations

Instream Flow

- Include current conditions and include streamflow protected by Environmental Flow Standards
  - Structure improvement of how data is presented
  - No additional cost
- Narrative explaining the context of the Current Conditions and E-Flows Standards lines on the chart



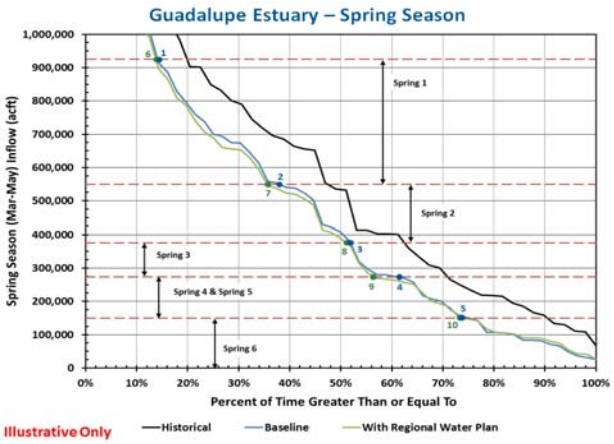
Illustrative Only

Environmental Assessment Workgroup

Recommendations

Freshwater Flows

- Include target flow regimes based on environmental freshwater inflow standards as a point of comparison
  - Structure improvement of how data is presented
  - No additional cost
- Narrative explaining the lines and points on the graphic



Illustrative Only

Environmental Assessment Workgroup

Conclusion

- To adopt the environmental assessment enhancements as recommended by the workgroup
  - The recommendations will result in environmental assessments in the Region L Plan that are:
    - Realistic
    - Modern – Up to date data
    - Concise
    - Meaningful and more easily understood

•Photo Credit: Audubon. Western Burrowing Owl

Environmental Assessment Workgroup Recommendations to Region L Planning Group

Steven Siebert

Chair/ Environmental Assessment Workgroup

August 3, 2017

Region L Planning Group Meeting

10. Discussion and Appropriate Action Regarding the Status of the Minimum Standards Workgroup

11. Discussion and Appropriate Action Regarding the following components of the 2021 Plan Enhancement Process
    a. The Role of Reuse Within the Regional Water Plan
    b. Identifying Special Studies or Evaluations Deemed Important to Enhance The 2021 Plan and Identification of Outside Funding Sources
    c. The Extent to Which Innovative Strategies Should Be Used

BUILDING A WORLD OF DIFFERENCE

3 August 2017

Effluent, Modeling, & Reuse Background Information

Brian Perkins

BUILDING A WORLD OF DIFFERENCE®

BLACK & VEATCH

Effluent

Effluent in Regional Planning WAM Modeling

There are 2 ways effluent is modeled in WAM:

1. **Return Flow Factors on Water Rights**
   - Directly tied to a Water Right
   - Used to emulate requirements written in Water Rights Permits (Consumptive/Non-Consumptive)
2. **Point Discharges**
   - Not directly tied to a Water Right
   - Used to emulate historical discharges from most WWTPs

Modeling Assumptions

	Existing Supplies	WMS Evaluation	Cumulative Effects
Purpose	Sets WUG's Current Supply	Sets WMS's New Firm Supply	How RWP Will Affect Flows
Rules	Full Authorized WR Amounts Default is No Effluent, But Request Can Be Made	Full Authorized WR Amounts No Effluent (TWDB)	Full Authorized WR Amounts Effluent at RWPG's Discretion
2016 RWP	2006 Historical Effluent	No Effluent	2070 Projected Effluent

3

Existing Supply Analyses

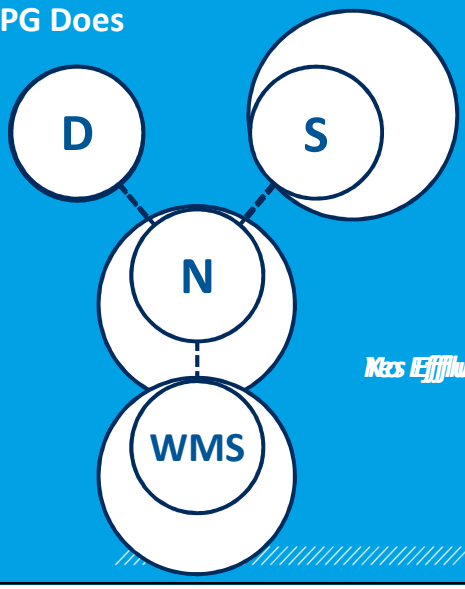
Existing Supplies

Sets WUG's Current Supply

Full Authorized WR Amounts

Default is No Effluent, But Request Can Be Made

- Critical Step in Planning Process
- One of the Most Valuable Work RWPG Does



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- Consistent with "Run 3"
- Consistent with TCEQ Permitting
- Effluent Exception: A Project Has Dedicated Effluent Discharges from a WWTP via Contractual Agreement

Evaluation of Water Management Strategies

WMS Evaluation

Sets WMS's New Firm Supply

Full Authorized WR Amounts

No Effluent (TWDB)

Cumulative Effects Analysis

Cumulative Effects

How RWP Will Affect Flows

Full Authorized WR Amounts

Effluent at RWPG's Discretion

- If Fully Implemented, What Effect Does RWP Have on Instream Flows & Freshwater Inflows
- Decision from Existing Supply Analyses Sets Foundation
- How WMSs Are Evaluated Affect This Too
- What is the Likely Effluent Situation in the Future (2070)?

Modeling Assumptions

	Existing Supplies	WMS Evaluation	Cumulative Effects
Purpose	Sets WUG's Current Supply	Sets WMS's New Firm Supply	How RWP Will Affect Flows
Rules	Full Authorized WR Amounts Default is No Effluent, But Request Can Be Made	Full Authorized WR Amounts No Effluent (TWDB)	Full Authorized WR Amounts Effluent at RWPG's Discretion
2021 RWP	???	No Effluent	???

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Reuse

Reuse/Recycle/Reclaimed

Reuse is included in the Region L Plan in 2 Ways

Existing Supplies

Existing Supply

- Those Reuse Projects that are constructed, operating, and delivering water to customers (SAWS Recycle Program)
- Used in the Calculation of Need
- (Needs = Demands – Existing Supplies)

Cumulative Effects

Water Management Strategies

- Planned Reuse Projects to meet Needs

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Reuse Supplies in Region L

WUGs/WWPs with Reuse as an Existing Supplies (2016 RWP)

- SAWS
- San Marcos
- New Braunfels
- GBRA
- SARA
- Kyle
- Kenedy
- Boerne

Reuse Projects (WMSs) in Region L

Reuse as a Recommended WMS (2016 RWP)

- SAWS Direct Reuse
- Dos Rios WWTP – CPS Energy Pipeline
- NBU Direct Reuse
- San Marcos Direct Reuse
- Kyle Direct Reuse
- SARA Direct Reuse
- CCMA Direct Reuse

9

Reuse Evaluation In Regional Planning

Example Municipal Utility (YR 2050)	
Water Demand	100,000 acft/yr
Existing Supplies	80,000 acft/yr
Need	20,000 acft/yr
WWTP Influent/Effluent*	60,000 acft/yr
WMS: Reuse	20,000 acft/yr

** Assumed 60% of Demand*

In the past, we've avoided the Potable/Non-Potable Issue Here

10

12. Evergreen Underground Water Conservation District Presentation on Weather Modification as a Potential Innovative Water Management Strategy

13. Discussion and Appropriate Action Regarding Consultant’s Work and Schedule

14. Possible Agenda Items for the Next Region L Meeting
    a. SAWS 2017 Water Management Plan Presentation
    b. Status and Possible Action Regarding Draft Population Demand Projections
    c. Minimum Standards Recommendation or Status Update
    d. Discussion Regarding Hydrologic Assumptions

15. Public Comment