



MEETING MATERIALS

July 1, 2015

San Jacinto River Authority

**Region H Water Planning Group
10:00 AM Wednesday
July 1, 2015
San Jacinto River Authority Office
1577 Dam Site Rd, Conroe, Texas 77304**

NOTICE TO PUBLIC

There are three items in this notice and agenda for the RHWPG meeting on July 1, 2015: (1) Public Hearing on the Initially Prepared Plan for 2016; (2) Possible Action on Amendment to the 2011 Regional Water Plan as part of the (3) regularly scheduled RHWPG meeting.

Notice of Amendment to the 2011 Region H Regional Water Plan

The Region H Water Planning Group will consider adoption of amendments to the 2011 Region H Water Plan as included in items 6 and 7 of the attached agenda. The amendment is deemed minor and will account for the revision of capital costs related to surface water transmission projects to be developed by the Central Harris County Regional Water Authority. The proposed amendment to the Plan will be discussed and acted upon during a public meeting of the RHWPG.

Copies of the proposed amendments to the Regional Water Plan is available on the Region H website at <http://www.regionhwater.org/>. Oral comments on the proposed amendments may be received at the Region H Planning Group meeting. Written comments from the public must be submitted to SJRA by July 15, 2015 for inclusion with the submitted amendment package. Comments can be submitted to SJRA as follows:

Jace Houston, General Manager
San Jacinto River Authority
Administrative Agent for Region H
P. O. Box 329
Conroe, Texas 77305-0329

For additional information, please contact:

- Region H, c/o Jace Houston, General Manager, SJRA, P. O. Box 329, Conroe, Texas 77305-0329, telephone 936-588-3111, and email info@regionhwater.org.

PUBLIC HEARING ON INITIALLY PREPARED PLAN AGENDA

1. Welcome.
2. Receive presentation on 2016 Initially Prepared Plan for Region H.
3. Receive public comment on 2016 Initially Prepared Plan for Region H.

REGION H PUBLIC MEETING AGENDA

4. Introductions.
5. Review and approve minutes of April 8, 2015 meeting.
6. **Receive public comments on specific issues related to agenda items 7 through 14.** (Public comments limited to 3 minutes per speaker)
7. Receive presentation on and discuss proposal to amend the 2011 Region H Regional Water Plan related to development of proposed surface water transmission infrastructure by the Central Harris County Regional Water Authority.
8. Consider action to amend the 2011 Region H Regional Water Plan related to development of proposed surface water transmission infrastructure by the Central Harris County Regional Water Authority.
9. Receive presentation from Averitt and Associates regarding Year Two of the Goldwater Study on water conservation in Region H.
10. Receive update from Consultant Team regarding the schedule and milestones for the development of the 2016 Region H Regional Water Plan.
11. Receive presentation from Consultant Team regarding the submittal of electronic components of the 2016 Initially Prepared Plan to the Texas Water Development Board.
12. Consider authorizing the San Jacinto River Authority to request statements of qualifications to prepare the 2021 Region H Regional Water Plan on behalf of the Region H Water Planning Group.
13. Receive report regarding recent and upcoming activities related to communications and outreach efforts on behalf of the Region H Planning Group.
14. Agency communications and general information.
15. **Receive public comments.** (Public comments limited to 3 minutes per speaker)
16. Next Meeting: October 7, 2015.
17. Adjourn.

Persons with disabilities who plan to attend this meeting and would like to request auxiliary aids or services are requested to contact Jodi Chaney at (936) 588-3111 at least three business days prior to the meeting so that appropriate arrangements can be made.

Agenda Item 2

Receive presentation on 2016 Initially Prepared Plan for
Region H.

REGION H

Water Planning Group



2016 REGION H INITIALLY PREPARED REGIONAL WATER PLAN

San Jacinto River Authority
Conroe, TX

1 July 2015

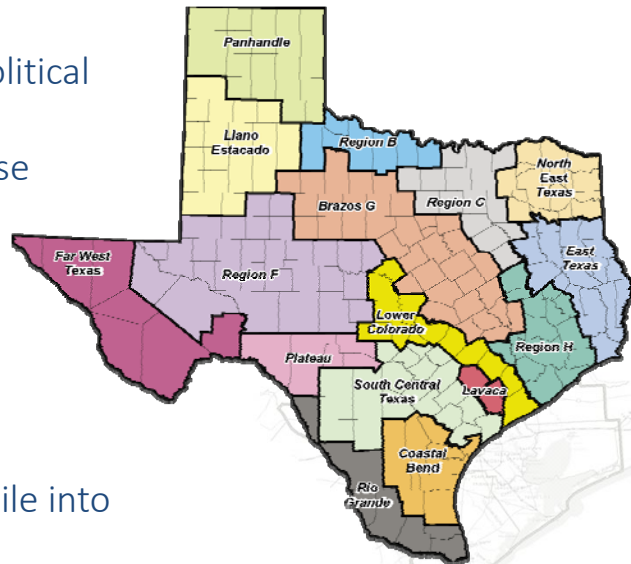
Freese and Nichols, Inc. | LBG-Guyton Associates | Ekistics Corporation

Water Planning in Texas

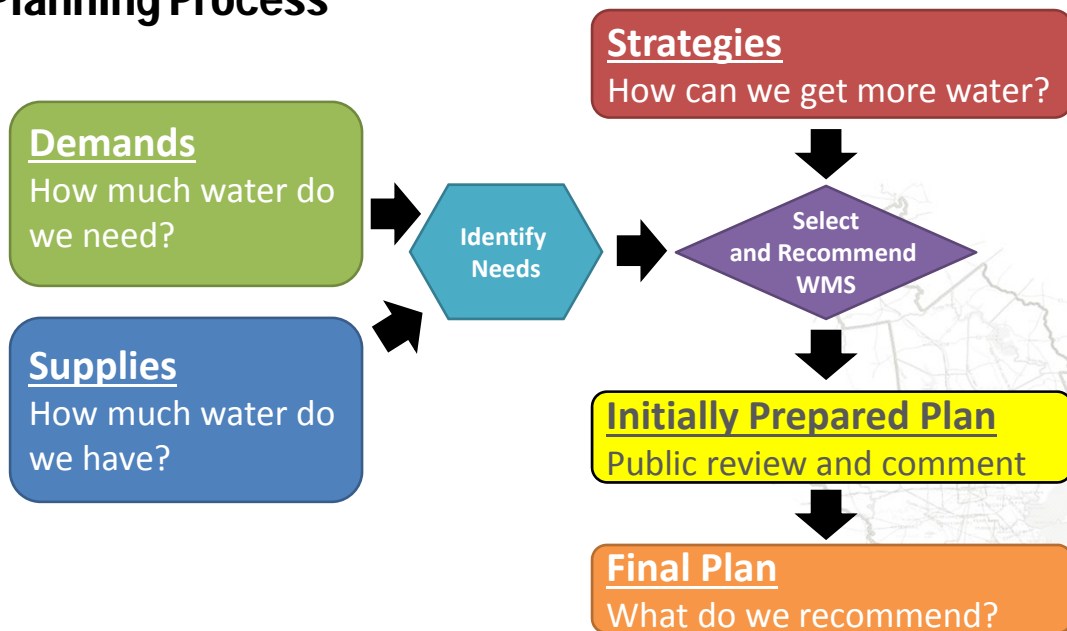


Regional Water Plans

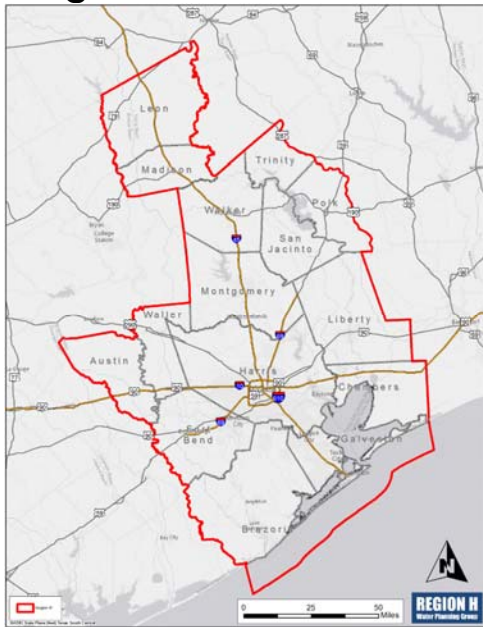
- 16 regions based on natural and political boundaries
- Volunteer planning groups of diverse interests
- Five-year cycle
 - 2001
 - 2006
 - 2011
 - 2016
- Regional Water Plans (RWPs) compile into State Water Plan (SWP)



The Planning Process



Region H

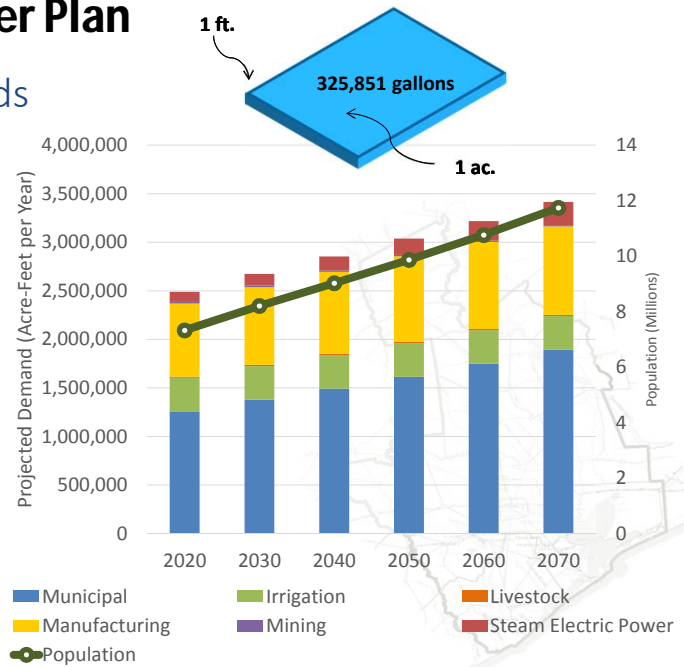
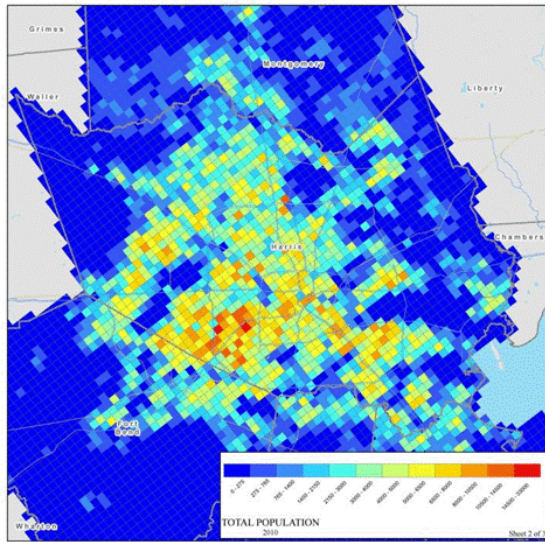


About Region H

- Extends over 15 counties
- Groundwater
 - Two major aquifers
 - Four minor aquifers
- Surface water
 - Three river basins
 - Three major reservoirs
- 26 Planning Group members
 - 12 interest groups represented

Region H 2016 Regional Water Plan

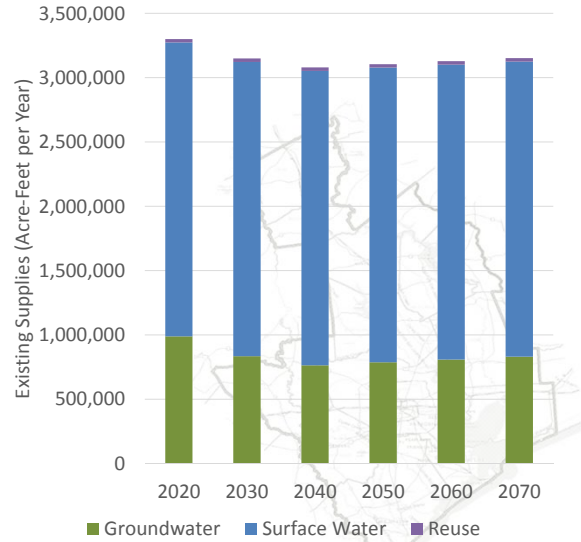
Population and Water Demands



Region H 2016 Regional Water Plan

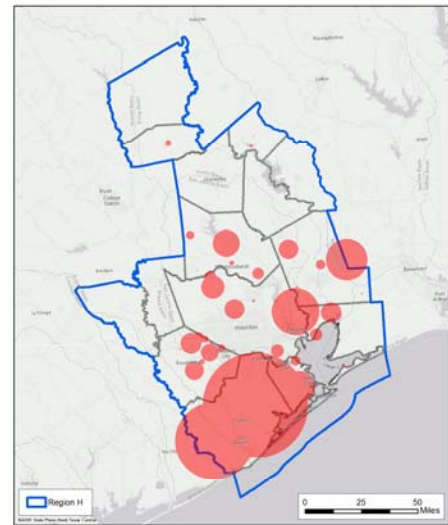
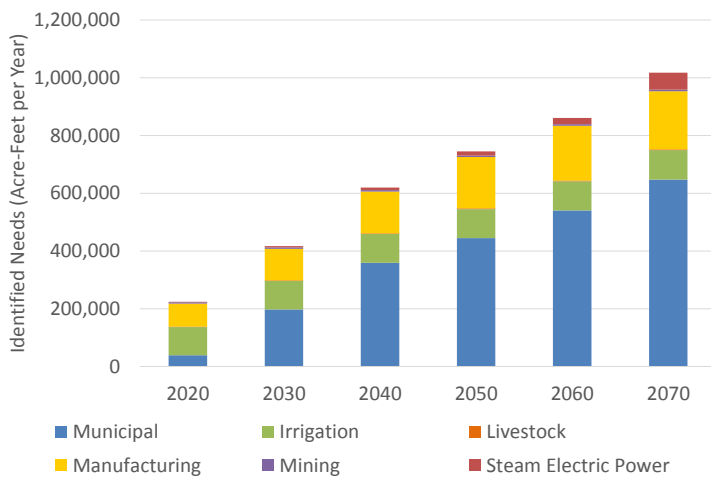
Available Water Supplies

- Surface Water
 - Drought-of-record
 - Texas Commission on Environmental Quality (TCEQ) Water Availability Model (WAM)
- Groundwater
 - Groundwater Management Area Process
 - GMAs 11, 12, and 14
- Reuse
 - Direct and indirect sources



Region H 2016 Regional Water Plan

Needs (Shortages)



Identified WUG Needs
2020 Decade

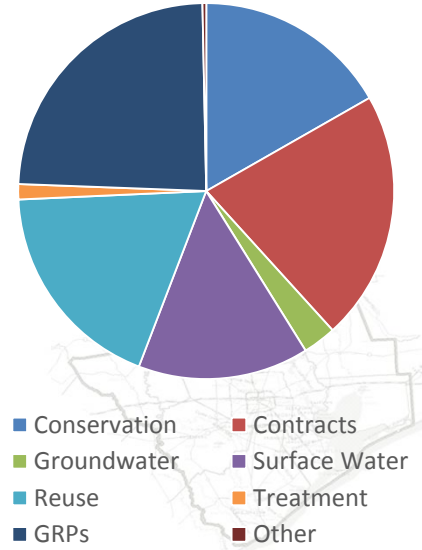


Region H 2016 Regional Water Plan

Water Management Strategies and Projects

- 70 Water Management Strategies (WMS)
 - Missouri City Groundwater Reduction Plan
 - New/Expanded Contract with BRA
- 705 Projects
 - Luce Bayou Transfer
 - Allens Creek Reservoir
- Key Projects by category

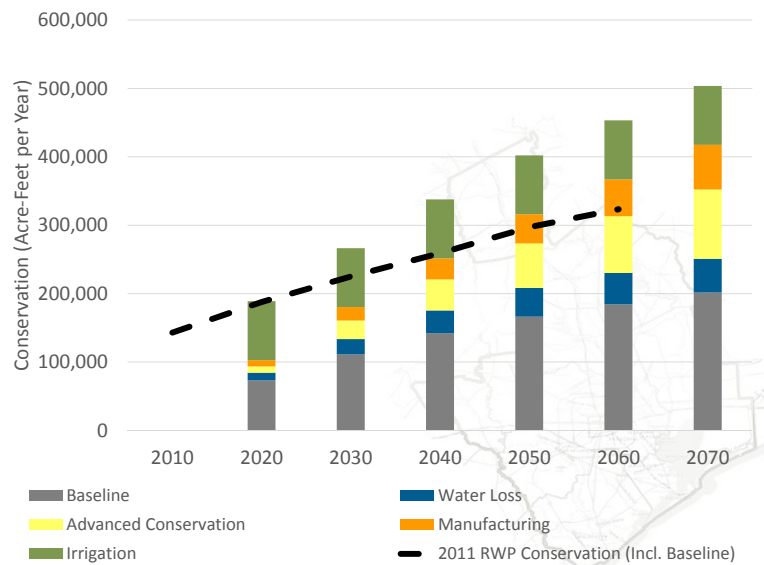
2070 Projects



Region H 2016 Regional Water Plan

Conservation Projects

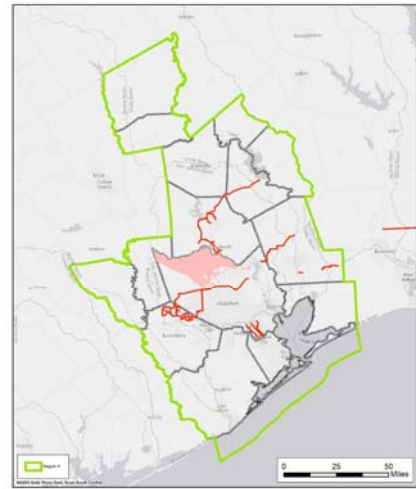
- Industrial
- Irrigation
- Municipal
 - Baseline
 - Advanced
 - Water Loss Reduction



Region H 2016 Regional Water Plan

■ Conveyance Projects

- GRP Transmission and Distribution
 - CHCRWA
 - NFBWA
 - NHCRWA
 - WHCRWA
- East Texas Transfer
- Lake Livingston to SJRA Transfer
- Luce Bayou Transfer
- Old Galveston Road Transmission



2016 Region H RWP
Conveyance Projects

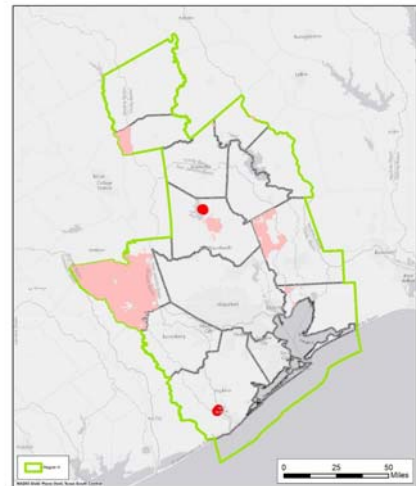


Texas

Region H 2016 Regional Water Plan

■ Groundwater Development Projects

- Brackish Groundwater Supplies
 - General
 - BWA
 - City of Conroe
- Expanded Use of Groundwater
- Groveton Groundwater Expansion
- SJRA Catahoula Aquifer Supplies



2016 Region H RWP
Groundwater Development
Projects



Texas

Region H 2016 Regional Water Plan

Groundwater Reduction Plans

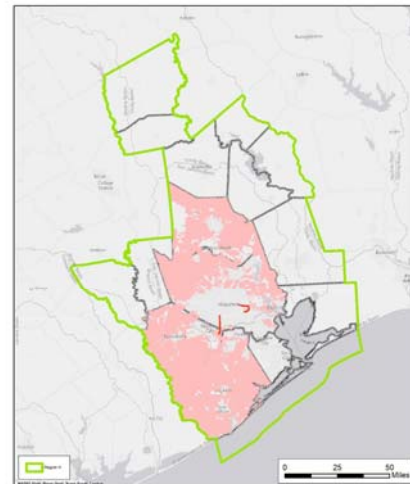
- CHCRWA
- City of Houston
- City of Missouri City
- City of Richmond
- City of Rosenberg
- City of Sugar Land
- Fort Bend County MUD 25
- Fort Bend County WCID 2
- NFBWA
- NHCRWA
- Panorama Village and Shenandoah
- Porter SUD
- River Plantation
- SJRA
- WHCRWA



Region H 2016 Regional Water Plan

Reuse Projects

- Indirect
 - City of Conroe
 - City of Houston
 - City of Pearland
 - GCWA Reclaimed Water from Houston
 - Montgomery County MUDs #8 and #9
 - Regional Return Flows
 - SJRA City of Conroe
- Direct
 - Wastewater Reclamation for Municipal Irrigation



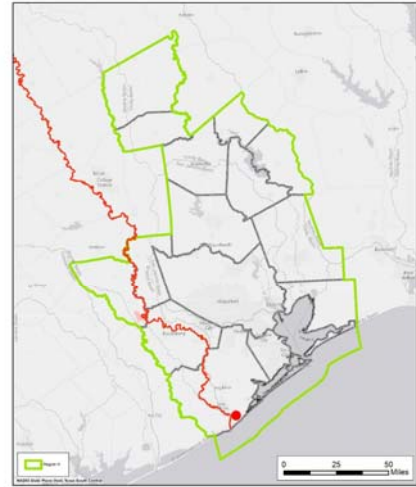
2016 Region H RWP
Reuse Projects



Region H 2016 Regional Water Plan

■ Surface Water Projects

- Allens Creek Reservoir
- BRA System Operation Permit
- Dow Expansion to Harris Reservoir
- Freeport Seawater Desalination



2016 Region H RWP
Surface Water Projects

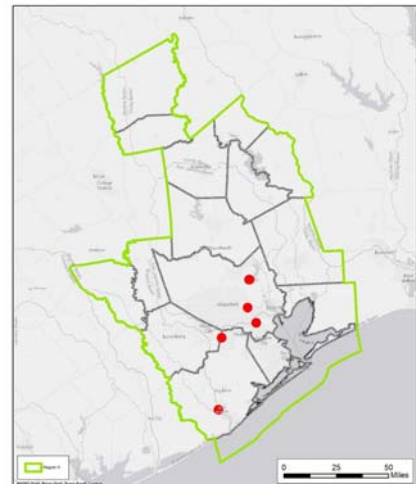


Texas

Region H 2016 Regional Water Plan

■ Treatment Projects

- BWA Treatment Plant Expansion
- City of Houston Treatment Expansion
- CLCND West Chambers County System
- Houston NEWPP Expansion
- Pearland Surface Water Treatment Plant



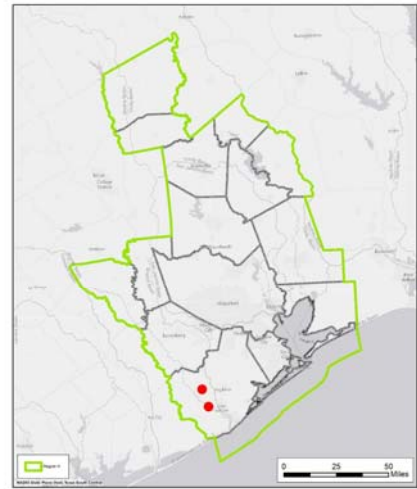
2016 Region H RWP
Treatment Projects



Texas

Region H 2016 Regional Water Plan

- Other Projects
 - Brazos Saltwater Barrier

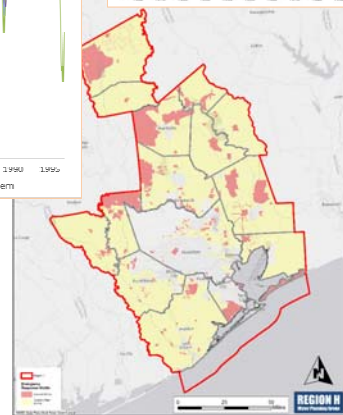
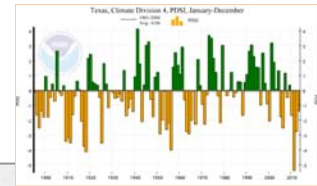
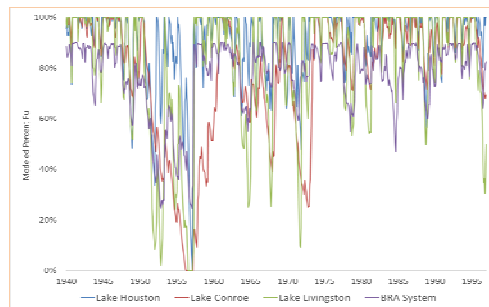


2016 Region H RWP
Other Projects



Region H 2016 Regional Water Plan

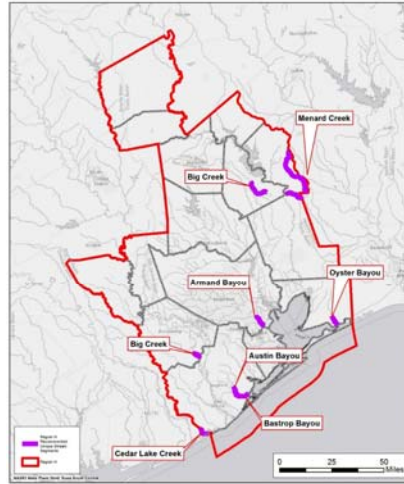
- Drought Response
 - Drought of Record
 - Drought Preparations
 - Emergency Responses
 - Drought Recommendations



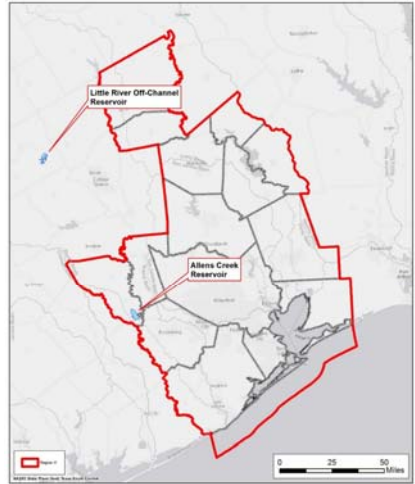
Region H 2016 Regional Water Plan

Unique Stream Segments, Reservoir Sites, and Other Recommendations

- Administrative
- Legislative
- Funding



Recommended Unique Stream Segments



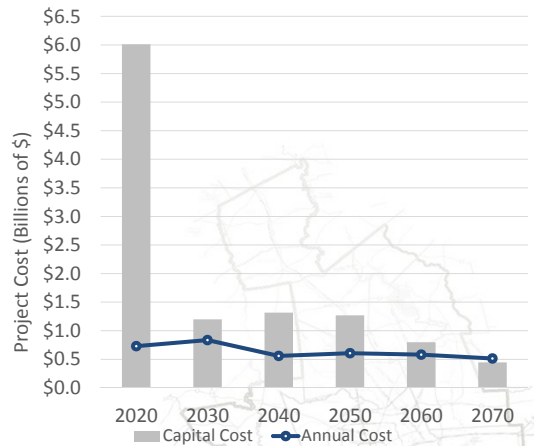
Recommended Unique Reservoir Sites



Region H 2016 Regional Water Plan

Project Financing Mechanisms

- State Water Implementation Fund for Texas (SWIFT)
- Water Infrastructure Fund (WIF)
- Texas Water Development Fund (D Fund)
- Drinking Water State Revolving Fund (DWSRF)



IPP Public Process

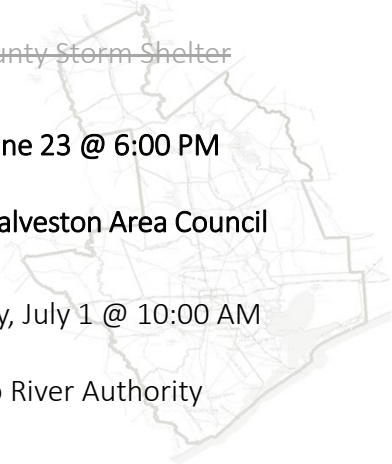
- Initially Prepared Plan Available
 - <http://www.regionhwater.org>
 - Office of the County Clerk in each county
 - Depository library in each county

- Public Hearings

- ~~Thursday, June 18 @ 6:00 PM~~
Huntsville
Walker County Storm Shelter

- Tuesday, June 23 @ 6:00 PM**
Houston
Houston-Galveston Area Council

- Wednesday, July 1 @ 10:00 AM
Conroe
San Jacinto River Authority



IPP Public Process

- Deadline for Public Comments

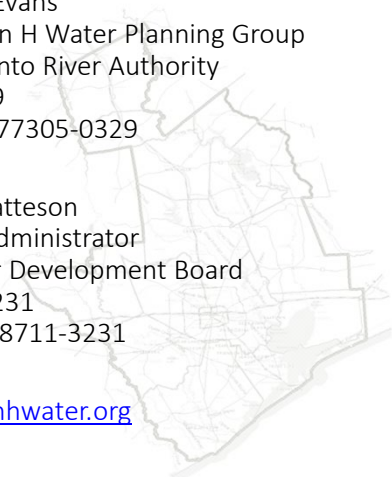
5:00 PM
September 1
2015

- To Submit Comments

- Hon. Mark Evans
Chair, Region H Water Planning Group
c/o San Jacinto River Authority
P.O. Box 329
Conroe, TX 77305-0329

- Mr. Kevin Patteson
Executive Administrator
Texas Water Development Board
P.O. Box 13231
Austin, TX 78711-3231

- info@regionhwater.org



Agenda Item 5

Review and approve minutes of April 8, 2015 meeting.

MINUTES
REGION H WATER PLANNING GROUP
APRIL 08, 2015
SAN JACINTO RIVER AUTHORITY
GENERAL AND ADMINISTRATION BUILDING
1577 DAM SITE ROAD
CONROE, TEXAS

MEMBERS PRESENT: Pudge Willcox, Gene Fisseler, James Comin, Glenn Lord, John Blount, John R. Bartos, Jace A. Houston, Mark Evans, David Bailey, Robert Bruner, Art Henson, David Collinsworth, Ronald J. Neighbors, Bob Hebert, and Kathy Turner Jones.

DESIGNATED ALTERNATES: Lisa Lattu for Jun Chang, Abby Paben for Zach Holland, Jim Sims for Kevin Ward, Ken Kramer for Carl Masterson, Paul Nelson for Jimmy Schindewolf, Marvin Marcell for Michael Turco, Ivan Langford for Robert Istre, and Tom Michel for William Teer.

MEMBERS ABSENT: None

NON-VOTING MEMBERS PRESENT: Sarah Backhouse for Lann Bookout.

CALL TO ORDER

The meeting was called to order at 10:05 a.m.

1. INTRODUCTIONS

Mr. Evans welcomed Sarah Backhouse from the Texas Water Development Board as well as alternate voting members present.

2. REVIEW AND APPROVE MINUTES OF MARCH 11, 2015 MEETING.

Mr. Bartos made a motion to approve the minutes of March 11, 2015. The motion was seconded by Mr. Blount and carried unanimously.

3. REVIEW AND APPROVE MINUTES OF APRIL 1, 2015 MEETING.

Mr. Lord made a motion to approve the minutes of April 1, 2015. The motion was seconded by Mr. Fisseler and carried unanimously.

4. RECEIVE PUBLIC COMMENTS ON SPECIFIC ISSUES RELATED TO AGENDA ITEMS 5 THROUGH 12. (PUBLIC COMMENTS LIMITED TO 3 MINUTES PER SPEAKER)

Emily Seldomridge, Water Policy and Outreach Specialist with the Galveston Bay Foundation, gave a brief overview of the Foundation. Ms. Seldomridge stated that the estimated costs in the Initially Prepared Plan are much higher than several of the key infrastructure projects. Although this was addressed in the previous meeting, Ms. Seldomridge wanted to make sure it was stated again since water conservation helps stretch supplies, keeps treatment costs down, as well as minimizes energy usage. Ms. Seldomridge stated that there needs to be a reflection of the true costs of water conservation in the plan because the current numbers will be a problem for regional planning, and when it is rolled into the state plan, the cost will inflate what the overall implementation is.

Ms. Seldomridge also asked for clarity on how certain projects are prioritized in the Initially Prepared Plan. Mr. Evans stated that this will be discussed during agenda item 8 and 13.

5. RECEIVE PRESENTATION FROM CONSULTANT TEAM REGARDING THE PROPOSED APPLICATION BY CENTRAL HARRIS COUNTY REGIONAL WATER AUTHORITY TO AMEND THE 2011 REGION H REGIONAL WATER PLAN AND CONSIDER APPROVING THE SUBMITTAL OF THE APPLICATION PACKAGE TO TWDB FOR THE DETERMINATION OF MINOR AMENDMENT STATUS.

Mr. Afinowicz explained that this will be the proposed fourth amendment for the 2011 Plan stating that there is a need to add a cost into the plan for the projects that were already represented volume-wise in the Plan that were not previously presented. He also explained that if it is determined to be a minor amendment, a notice will need to be sent fourteen days prior to the public hearing to be held on July 1st with a fourteen day comment period following the meeting if the amendment is adopted. A motion was made by Mr. Bruner to approve submitting the application package to the Texas Water Development Board to determine minor amendment status. The motion was seconded by Mr. Neighbors and carried unanimously.

6. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING THE SCHEDULE AND MILESTONES FOR THE DEVELOPMENT OF THE 2016 REGION H REGIONAL WATER PLAN.

Mr. Afinowicz explained that there is a final submittal date of the draft Initially Prepared Plan of May 1st, 2015, to the Texas Water Development Board. He also explained that there is a public hearing date of July 1st, 2015, for any public comments on the draft Initially Prepared Plan. Mr. Evans clarified that there is a five month period to make and submit comments to the planning group with three opportunities to make public comments. Ms. Backhouse clarified that there is a thirty day posting notice prior to the public hearing with a sixty day comment period after the public hearing for public comments and a ninety day comment period for State and Federal agencies. Mr. Afinowicz explained that database entry and data deliverables are key parts due by July 1, 2015. Mr. Afinowicz also stated that requests for inclusion in the Regional Water Plan should be made in writing.

7. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING THE SCHEDULE OF PUBLIC HEARINGS RELATED TO THE 2016 REGION H INITIALLY PREPARED REGIONAL WATER PLAN.

Mr. Afinowicz stated that the public hearing dates are tentative for June 16, 2015, at the Sam Houston Memorial Museum, June 23, 2015, at the Houston-Galveston Area Council, and July 1, 2015, at the San Jacinto River Authority.

8. REVIEW COMMENTS RECEIVED AND REVISIONS MADE TO THE DRAFT INITIALLY PREPARED PLAN.

Mr. Afinowicz briefly explained that there have been a number of comments received specifically related to revisions to recommended projects such as long-term Montgomery County supplies, Catahoula brackish groundwater and increased indirect reuse, Montgomery County MUDs 8 and 9 indirect reuse project from the 2011 Regional Water Plan, San Jacinto River Authority impacts to regional return flow reuse, and adding blended sources from the GCWA reuse from COH and Brazos River (Allens Creek) supplies. He stated that all comments will be incorporated into the Initially Prepared Plan.

9. CONSIDER AND APPROVE THE CONSULTANT TEAM TO PREPARE FINAL COPIES OF THE REVISED INITIALLY PREPARED PLAN AND SUBMIT TO TEXAS WATER DEVELOPMENT BOARD NO LATER THAN MAY 1, 2015.

Mr. Houston made a motion to adopt the Initially Prepared Plan, certify the Initially Prepared Plan achieves the long term goals of Region H, as well as, the requirements of the applicable statutes, rules and our Texas Water Development Board contract, that we direct the consultant team to document this motion in a cover letter and submit the letter and Initially Prepared Plan to the Texas Water Development Board prior to May 1, 2015, and

make the Initially Prepared Plan available for public review and comment as required by statute. The motion was seconded by Mr. Henson. Ms. Backhouse stated that a motion needed to be made approving posting notices for public hearings. Mr. Houston amended his motion by adding that the consultant team shall post the statutorily required notices for the public hearings and comment periods. The amended motion was seconded by Mr. Henson and carried unanimously.

10. CONSIDER AUTHORIZING THE REQUEST OF ADDITIONAL FUNDING FOR THE STUDY OF WATER MANAGEMENT STRATEGIES FROM THE TEXAS WATER DEVELOPMENT BOARD.

Mr. Afinowicz explained that funding has been allocated by the Texas Water Development Board based on a methodology including a certain amount of funding that has been allocated just for the purpose related to evaluating and working with the application of Water Management Strategies that came in two different bienniums of funding. A motion was made by Mr. Hebert to request additional funding for the study of Water Management Strategies from the Texas Water Development Board. The motion was seconded by Mr. Houston and carried unanimously.

11. RECEIVE REPORT REGARDING RECENT AND UPCOMING ACTIVITIES RELATED TO COMMUNICATIONS AND OUTREACH EFFORTS ON BEHALF OF THE REGION H PLANNING GROUP.

Mr. Afinowicz gave a brief update regarding upcoming presentations at the Association of Water Board Directors and the Rotary Club of Brazos County.

12. AGENCY COMMUNICATIONS AND GENERAL INFORMATION.

Sarah Backhouse with the Texas Water Development Board stated that on April 10th, an item will go before their Board to receive authorization to execute contracts for the fifth cycle which need to be executed by both parties by the end of August 2015. Ms. Backhouse also stated that draft contracts are planned to be sent to political subdivisions by May 1, 2015. Ms. Backhouse briefly explained that at the April 29th TWDB meeting, the State Water Plan Amendment Number Three, including the most recent major and minor amendments for the 2011 Region H Plan, will go before the Board, and a public hearing for the amendment will be held on April 27, 2015. Mr. Kramer gave a brief discussion about outside water restrictions and the success it has on savings.

13. RECEIVE PUBLIC COMMENTS.

Keith Koutach, representing Save Water Co., spoke in regards to the company's strategies on eliminating water loss and the projected impact it has on the Houston/Metro residential area. Mr. Evans stated that Mr. Koutach would be available to answer questions after the meeting.

14. NEXT MEETING.

The next meeting will be July 1, 2015.

15. ADJOURN

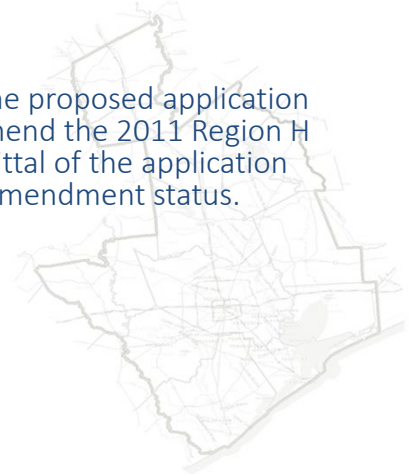
Without objection, the meeting was adjourned at 10:57 a.m.

Agenda Item 7

Receive presentation on and discuss proposal to amend the 2011 Region H Regional Water Plan related to development of proposed surface water transmission infrastructure by the Central Harris County Regional Water Authority.

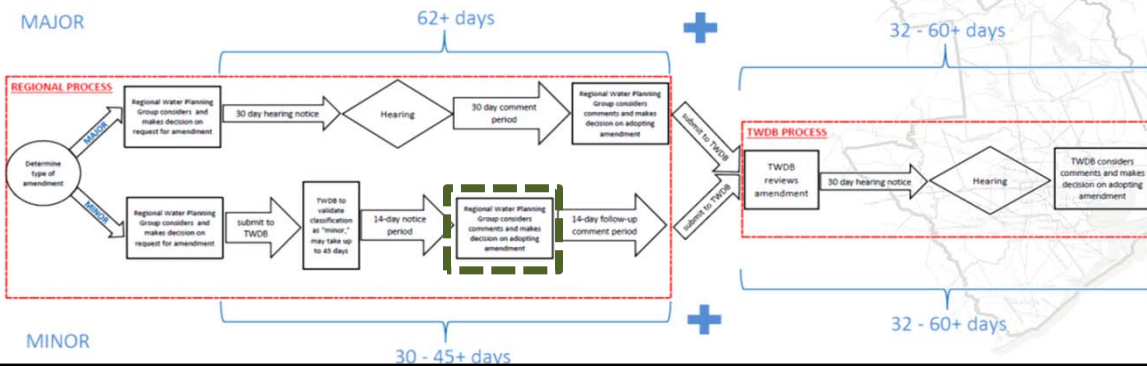
Agenda Item 7 CHCRWA Amendment

Receive presentation from Consultant Team regarding the proposed application by Central Harris County Regional Water Authority to amend the 2011 Region H Regional Water Plan and consider approving the submittal of the application package to TWDB for the determination of minor amendment status.



Agenda Item 7 CHCRWA Amendment

- Since April
 - Submitted draft amendment package to TWDB
 - Received confirmation of minor amendment status
 - Provided proper notice and posting of amendment package



Agenda Item 7 CHCRWA Amendment

- Amendment process
 - 14-day notice has been provided
 - TODAY: Review proposed amendment
 - TODAY: Consider action on amending 2011 RWP
 - 14-day comment period
 - Submit amendment package and comments to TWDB



Agenda Item 7 CHCRWA Amendment

- Transmission Line to CHCRWA Municipal WUG and WWP

Description	The transmission of Lake Houston surface water supplies via the Northeast Water Purification Plant (NEWPP) to the Central Harris County Regional Water Authority (CHCRWA) to meet projected shortages.
Quantity	Approximately 4,800 acre-feet per year.
Source	Surface water from Lake Houston and Lake Livingston via NEWPP.
Decade	2010 – Greens Road Transmission line, Phase I and Major Distribution Infrastructure
Total Cost	\$8,737,162 capital cost, transmission \$11,283,234 capital cost, distribution
Unit Cost	\$78 per acre-foot for transmission \$101 per acre-foot for distribution

Agenda Item 7 CHCRWA Amendment

- 2011 RWP amendment package
 - Revisions to Executive Summary
 - Revisions to Chapter 4
 - Appendix 4A supply allocation tables
 - Appendix 4C cost tables
 - Amended tech memorandum
 - Transmission Line to CHCRWA Municipal
 - WUG and WWP
 - DB12 database entries



April 24, 2015

Mr. Mark Evans
Region H Chair
North Harris County Regional Water Authority
3648 Cypress Creek Parkway #110
Houston, Texas 77068

Re: Region H request for a determination of a minor amendment for Central Harris County Regional Water Authority's (CHCRWA) Transmission Line.

Dear Mr. Evans:

I have reviewed Region H's request, and based on Region H's request and supporting materials, have determined that adding the costs associated with CHCRWA's Transmission Line water management strategy constitutes a minor amendment under 31 TAC §357.51(c).

If Region H adopts the proposed minor amendment, Region H will need to:

1. Provide the Texas Water Development Board (TWDB) with documentation of the planning group action adopting this water management strategy as a minor amendment;
2. Issue and distribute an addendum to the 2011 Region H Regional Water Plan updating the plan accordingly;
3. Provide TWDB with corrected DB12 data to reflect all the associated changes to the 2011 Region H Regional Water Plan and the 2012 State Water Plan; and,
4. Request that the CHCRWA obtain a web link from TWDB staff in order to fill out an associated online Infrastructure Financing Survey regarding how the entity plans to finance the projects associated with the amendment.

If Region H makes any substantive changes to the project components or configuration during the minor amendment process, TWDB will need to review the modified proposed amendment to ensure that the modified project still meets all of the criteria under 31 TAC §357.51(c).

Mr. Mark Evans, Region H Chair
April 24, 2015
Page 2

If you have any questions concerning this approval or its associated requirements, please contact Lann Bookout, the Board's designated regional water planning project manager for this region.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin Patteson', written over a horizontal line.

Kevin Patteson
Executive Administrator

cc: Mr. Jace Houston, General Manager, San Jacinto River Authority, PO Box 329, Conroe,
Texas 77305
Lann Bookout, TWDB

REGION H

Water Planning Group

MINOR AMENDMENT TO THE 2011 REGION H REGIONAL WATER PLAN

Central Harris County Regional Water Authority

May, 2015

Attachment	Description
A	Amended excerpt from Executive Summary Table ES-7
B	Amended excerpts from Chapter 4: Identification, Evaluation and Selection of Water Management Strategies Based on Needs
C	Amended Table 4A-3: Water Management Strategy Screening
D	Amended Table 4A-6: Decadal WMS Summary
E	Amended Technical Memorandum 4B17: Transmission Line to CHCRWA Municipal WUG and WWP
F	Amended Table 4C-1: WWP-Level Project Costs
G	Summary of database entries anticipated for DB12

Attachment A:

Amended excerpts from Executive Summary Table ES-7

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**Table ES-7
Recommended Water Management Strategies**

<u>WMS</u>	<u>Max Project Volume (ac-ft/yr)</u>	<u>WWP Capital Cost \$</u>	<u>WUG Capital Cost \$</u>	<u>Starting Decade</u>
Conservation Strategies:				
Industrial Conservation	TBD	\$0	TBD	2010
Irrigation Conservation	77,881	\$0	\$757,436	2010
Municipal Conservation	105,494	\$0	\$0	2010
Contractual Strategies:				
Expand/Increase Current Contracts	142,599	\$0	See Contracts	2010
New Contracts from Existing Supplies	83,558	\$0	See Contracts	2010
Reallocation of Existing Supplies	N/A	\$0	See Contracts	2010
TRA to SJRA Contract	76,476	\$302,781,597	See Contracts	2040
TRA to Houston Contract	123,524	See Luce Bayou	See Contracts	2030
WUG-Level Contracts ¹	N/A	\$0	\$2,390,273,157	2010
WWP Contracts	N/A	\$0	\$0	2010
Groundwater Strategies:				
Expanded Use of Groundwater	90,617	\$0	\$165,928,999	2010
Interim Strategies	45,512	\$0	\$86,701,535	2010
New Groundwater Wells for Livestock	41	\$0	\$18,635	2020
Groundwater Reduction Plans:				
CHCRWA GRP	4,806	See CHCRWA Trans.	\$0	2010
COH GRP	TBD	See COH Treatment	\$58,235,873	2010
City of Missouri City GRP	17,562	\$92,070,990	\$6,618,706	2010
Fort Bend MUD 25 GRP	589	\$0	\$776,145	2020
Fort Bend WCID 2 GRP	5,753	\$24,828,857	\$0	2020
NFBWA GRP ²	106,402	See NFBWA Trans.	\$1,638,063	2020
NHCRWA GRP ²	117,755	See NHCRWA Trans.	\$17,814,585	2010
Pecan Grove GRP	1,700	\$0	\$15,960,000	2020
Richmond/Rosenberg GRP	7,500	\$117,220,150	\$0	2020
River Plantation GRP	368	\$0	\$484,926	2010
SJRA WRAP ³	129,010	\$900,000,000	\$217,856,853	2020
Sugar Land GRP	9,796	\$161,360,049	\$6,360,101	2020
WHCRWA GRP ²	78,839	See WHCRWA Trans	\$35,268,970	2010
Infrastructure Strategies:				
BWA Brackish Groundwater	3,136	\$30,570,395	See Contracts	2020
BWA Plant Expansion	8,400	\$14,359,419	N/A	2020
CHCRWA Transmission Line	4,806	\$8,737,162	N/A	2010
CHCRWA Internal Distribution	4,806	\$11,283,234	N/A	2010
CLCND West Chambers System	2,800	\$20,380,000	See Contracts	2020
COH Distribution Expansion	TBD	\$261,040,000	N/A	2010
COH Treatment Expansion	Varies by decade	\$2,045,672,161	N/A	2010
Harris County MUD 50 WTP	632	\$0	\$6,131,600	2020
Huntsville WTP	11,200	\$61,023,906	\$0	2010
LLWSSSC Surface Water Project	954	\$0	\$3,087,974	2010
Luce Bayou Transfer	450,000	\$253,916,914	\$0	2020

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Attachment B:

Amended excerpts from Chapter 4: Identification, Evaluation and Selection of Water Management Strategies Based on Needs

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**Table 4-4
Recommended Water Management Strategies**

<u>WMS</u>	<u>Max Project Volume (ac-ft/yr)</u>	<u>WWP Capital Cost \$</u>	<u>WUG Capital Cost \$</u>	<u>Starting Decade</u>
Conservation Strategies:				
Industrial Conservation	TBD	\$0	TBD	2010
Irrigation Conservation	77,881	\$0	\$757,436	2010
Municipal Conservation	105,494	\$0	\$0	2010
Contractual Strategies:				
Expand/Increase Current Contracts	142,599	\$0	See Contracts	2010
New Contracts from Existing Supplies	83,558	\$0	See Contracts	2010
Reallocation of Existing Supplies	N/A	\$0	See Contracts	2010
TRA to SJRA Contract	76,476	\$302,781,597	See Contracts	2040
TRA to Houston Contract	123,524	See Luce Bayou	See Contracts	2030
WUG-Level Contracts ¹	N/A	\$0	\$2,390,273,157	2010
WWP Contracts	N/A	\$0	\$0	2010
Groundwater Strategies:				
Expanded Use of Groundwater	90,617	\$0	\$165,928,999	2010
Interim Strategies	45,512	\$0	\$86,701,535	2010
New Groundwater Wells for Livestock	41	\$0	\$18,635	2020
Groundwater Reduction Plans:				
CHCRWA GRP	4,806	See CHCRWA Trans.	\$0	2010
COH GRP	TBD	See COH Treatment	\$58,235,873	2010
City of Missouri City GRP	17,562	\$92,070,990	\$6,618,706	2010
Fort Bend MUD 25 GRP	589	\$0	\$776,145	2020
Fort Bend WCID 2 GRP	5,753	\$24,828,857	\$0	2020
NFBWA GRP ²	106,402	See NFBWA Trans.	\$1,638,063	2020
NHCRWA GRP ²	117,755	See NHCRWA Trans.	\$17,814,585	2010
Pecan Grove GRP	1,700	\$0	\$15,960,000	2020
Richmond/Rosenberg GRP	7,500	\$117,220,150	\$0	2020
River Plantation GRP	368	\$0	\$484,926	2010
SJRA WRAP ³	129,010	\$900,000,000	\$217,856,853	2020
Sugar Land GRP	9,796	\$161,360,049	\$6,360,101	2020
WHCRWA GRP ²	78,839	See WHCRWA Trans	\$35,268,970	2010
Infrastructure Strategies:				
BWA Brackish Groundwater	3,136	\$30,570,395	See Contracts	2020
BWA Plant Expansion	8,400	\$14,359,419	N/A	2020
CHCRWA Transmission Line	4,806	\$8,737,162	N/A	2010
CHCRWA Internal Distribution	4,806	\$11,283,234	N/A	2010
CLCND West Chambers System	2,800	\$20,380,000	See Contracts	2020
COH Distribution Expansion	TBD	\$261,040,000	N/A	2010
COH Treatment Expansion	Varies by decade	\$2,045,672,161	N/A	2010
Harris County MUD 50 WTP	632	\$0	\$6,131,600	2020

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Attachment C:

Amended Table 4A-3: Water Management Strategy Screening

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Region H
Table 4A-3: Water Management Strategy Screening

Water Management Strategy Screening Factor Weight:	Water User Group or Wholesale Provider	Strategy Description	Strategy Capital Cost (\$)	Average Annual Cost of Water (\$/ac-ft)	Major WWS	Earliest Potential Starting Decade	Firm Yield (ac-ft/yr)	Basin	Interbasin Transfer (Yes/No)	Impacts on Habitat / Stream / B&E Flows	Impacts on Landform	Decision Matrix Factors (High, Medium, Low)										Total of Screening Factors	Selected as Part of 2001 Plan	Selected as Part of 2006 Plan				
												Cost	Yield	Location	Water Quality	Environment	Local Preference	Institutional Constraints	Implementation Risk	Impacts on Water Resources	Impacts on Other Management Strategies							
Conservation Strategies																												
Industrial Conservation	Manufacturing	Reduce water demand through selected BMPs	TBD	TBD		2010	TBD	All	No	No impact	None	0	0	1	0	0	0	1	0	1						3	No	No
Irrigation Conservation																												
Brazoria County	Irrigation	Reduce irrigation losses through land leveling, point irrigation and canal lining	\$1,850,200 annual cost, on-farm methods \$198,200 capital cost, canal lining	\$99		2010	18,792	Brazos, Brazos-Colorado	No	Reduces losses that feed small streams	None	1	1	1	0	0	0	1	0	1						5	Yes	Yes
Chambers County	Irrigation	Reduce irrigation losses through land leveling, point irrigation and canal lining	\$2,338,300 annual cost, on-farm methods \$279,200 capital cost, canal lining	\$98		2010	24,018	Trinity	No	Reduces losses that feed small streams	None	1	1	1	0	0	0	1	0	1						5	Yes	Yes
Fort Bend County	Irrigation	Reduce irrigation losses through land leveling, point irrigation and canal lining	\$509,900 annual cost, on-farm methods \$56,500 capital cost, canal lining	\$99		2010	5,198	Brazos, Brazos-Colorado, San Jacinto-Brazos	No	Reduces losses that feed small streams	None	1	1	1	0	0	0	1	0	1						5	Yes	Yes
Galveston County	Irrigation	Reduce irrigation losses through land leveling, point irrigation and canal lining	\$231,100 annual cost, on-farm methods \$29,400 capital cost, canal lining	\$98		2010	2,392	San Jacinto - Brazos	No	Reduces losses that feed small streams	None	1	1	1	0	0	0	1	0	1						5	Yes	Yes
Liberty County	Irrigation	Reduce irrigation losses through land leveling, point irrigation and canal lining	\$2,089,800 annual cost, on-farm methods \$188,700 capital cost, canal lining	\$100		2010	20,877	Trinity	No	Reduces losses that feed small streams	None	1	1	1	0	0	0	1	0	1						5	Yes	Yes
Waller County	Irrigation	Reduce irrigation losses through land leveling, point irrigation	\$726,700 annual cost, on-farm methods	\$110		2050	6,606	San Jacinto	No	Reduces losses that feed small streams	None	1	1	1	0	0	0	1	0	1						5	Yes	Yes
Municipal Conservation	Multiple	Reduce demand through various methods	From \$3.9 to \$22.8 million for all WUGs collectively	\$202 (Sm Sys) \$311 (Med Sys) \$213 (Lg Sys)		2010	From 45,605 to 105,494	All	No	No impact	None	0	1	1	0	0	1	1	0	1						5	Yes	Yes
Contractual Strategies																												
Expand/ Increase Current Contracts	Multiple	Increase existing contracts to meet customer demands	At WUG level	System Rate		2010	Varies by contract. No new supply created	Multiple	Yes	Reduced streamflows due to use of currently unused supplies	None	1	0	1	0	0	1	1	0	1						5	Yes	Yes
New Contracts from Existing Supply	Multiple	Create new contracts from existing unallocated supplies	At WUG level	System Rate		2010	Varies by contract. No new supply created	Multiple	Yes	Reduced streamflows due to use of currently unused supplies	None	1	0	1	0	0	1	1	0	1						5		Yes
Reallocation of Existing Supply	Multiple	Reallocate surplus water to WUGs with shortages	At WUG level	System Rate		2010	Varies by contract. No new supply created	Multiple	Yes	Altered location of return flows	None	1	0	1	0	0	1	1	0	1						5	No	No
TRA to SJRA contract	TRA / SJRA	Sell uncommitted supply to SJRA.	\$302,781,597	\$687 Y		2040	76,476	Trinity to San Jacinto	Yes	Potential introduction of invasive species	Requires construction of new conveyance	0	1	0	0	0	0	0	-1	0						0	No	Yes
TRA to Houston Contract	TRA / Houston	Sell uncommitted supply to Houston	None - Infrastructure cost already reflected under Luce Bayou WMS	None - Infrastructure cost already reflected under Luce Bayou WMS		2030	123,524	Trinity to San Jacinto	Yes	Potential introduction of invasive species via Luce Bayou conveyance.	Unknown	1	1	0	0	0	1	1	-1	0						3	Yes	Yes
WUG Level Contracts	Multiple WUGs	Contracts from WUGs to WUGs. Includes contracts for volumes created under other yield-producing WMS	WUG-specific infrastructure	Contract Rate		2010	Varies by contract. No new supply created	All	Yes (source-dependent)	None - impacts associated with yield-creating WMS or infrastructure	None	NA	NA	NA	NA	NA	NA	NA	NA	NA						NA	NA	NA
WWP Contracts	Multiple WWPs	Contracts between WWPs. Includes contracts for volumes created under other yield-producing WMS	WUG-specific infrastructure	Contract Rate		2010	Varies by contract. No new supply created	All	Yes (source-dependent)	None - impacts associated with yield-creating WMS or infrastructure	None	NA	NA	NA	NA	NA	NA	NA	NA	NA						NA	NA	NA
Groundwater Strategies																												
Expanded Use of Groundwater	Multiple	Increase groundwater use, to the sustainable or permitted yield.	\$589,500 per 1 mgd well. \$165,928,999 total capital cost for WUG infrastructure	\$205		2010	90,617	All	No	Uses existing supply, return flows remain in basin of origin.	New wells may require some land clearing.	0	1	1	1	0	1	0	0	0						4	Yes	
Interim Strategies	Brazoria, Chambers, Galveston, Harris, and Montgomery Counties	Temporary groundwater use in excess of available supply	\$389,500 per 1 mgd well. \$86,701,535 total capital cost for WUG infrastructure	\$788 Y		2010	NA - temporary use of 45,512 ac-ft/yr	Multiple	No	Potential for subsidence and excess drawdown	New wells may require some land clearing.	1	1	1	0	-1	1	0	1	0						4	No	No
New Groundwater Wells for Livestock	Multiple	Added well capacity to facilitate expanded pumping or interim groundwater use	\$18,635	\$37		2010	41	San Jacinto-Brazos, Neches-Trinity	No	None - impacts associated with yield-creating WMS or infrastructure	New wells may require some land clearing.	0	NA	1	1	0	1	0	0	0						3	No	Yes
Groundwater Reduction Plans																												
CHCRWA GRP	CHCRWA	Conversion of CHCRWA to surface water.	See CHCRWA Treatment and Distribution WMS entries.	See CHCRWA Treatment and Distribution WMS entries.		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion															2	No	No
COH GRP	COH	Conversion of portions of COH service area to surface water	See COH Treatment Expansion and Distribution Expansion	See COH Treatment Expansion and Distribution Expansion		2010	NA	Multiple		Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion																No	No

Region H
Table 4A-3: Water Management Strategy Screening

Water Management Strategy	Water User Group or Wholesale Provider	Strategy Description	Strategy Capital Cost (\$)	Average Annual Cost of Water (\$/ac-ft)	Major WWS	Earliest Potential Starting Decade	Firm Yield (ac-ft/yr)	Basin	Interbasin Transfer (Yes/No)	Impacts on Habitat / Stream / B&E Flows	Impacts on Landform	Decision Matrix Factors (High, Medium, Low)										Total of Screening Factors	Selected as Part of 2001 Plan	Selected as Part of 2006 Plan			
												Cost	Yield	Location	Water Quality	Environment	Local Preference	Institutional Constraints	Risk of Implementation	Impacts on Water Resources	Impacts on Other Management Strategies						
Screening Factor Weight:												1	1	1	1	1	1	1	1	1	1						
Missouri City GRP	Missouri City	Conversion of Missouri City and surrounding area to surface water. Also includes Aquifer Storage and Recovery.	\$92,070,990 capital cost to WWP, \$8,397,800 infrastructure cost to participating WUGs	\$378 per ac-ft (WWP cost only excludes infrastructure cost of customer WUGs / GRP participation)		2020 (2013)	4,790 (new supply from reuse + ASR)	Brazos, San Jacinto-Brazos	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	0	1	0	0	1	0	0	0	0	1	No	No			
Fort Bend County MUD 25 GRP	Fort Bend MUD 25	A combination of reuse and surface water to allow for groundwater reduction.	\$766,100 capital cost (estimated as \$564 per acre-foot construction cost based on Wastewater Reuse for Municipal Irrigation (WMSI)).	\$499 for infrastructure - does not include customer contract rate		2020 (2013)	589 (Reuse)	Brazos	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	0	1	0	0	1	0	0	0	0	1	No	No			
Fort Bend County WCID No. 2 GRP	Fort Bend County WCID No. 2	Surface water conversion	\$24,828,857	\$353		2020 (2013)	NA	San Jacinto, San Jacinto-Brazos	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant	-1	0	1	0	0	1	0	0	0	0	1	No	No			
NFBWA GRP	NFBWA	Conversion of NFBWA to surface water. Also includes reuse and major water supply infrastructure.	\$1,638,000 infrastructure cost to WUGS. WWP infrastructure detailed separately.	See inf. Cost		2020 (2013)	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	1	0	0	1	0	0	0	0	0	2	No	No			
NHCRWA GRP	NHCRWA	Conversion of NHCRWA to surface water. Also includes major water supply infrastructure.	\$17,814,600 infrastructure cost to WUGS. WWP infrastructure detailed separately.	See inf. Cost		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	1	0	0	1	0	0	0	0	0	2	No	Yes			
Pecan Grove GRP	Pecan Grove	Conversion of Pecan Grove to surface water. Also includes reuse	\$15,960,000	\$865		2020 (2013)	NA	Brazos, San Jacinto-Brazos	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	0	1	0	0	1	0	0	0	0	1	No	No			
Richmond-Rosenberg GRP	Richmond, Rosenberg	Conversion of Richmond-Rosenberg to surface water.	\$117,220,150 capital cost for WWP contract	NA - existing contract		2020 (2015)	NA	Brazos	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	0	1	0	0	1	0	0	0	0	2	No	No			
River Plantation GRP	River Plantation	Entering into CWR with River Plantation CC golf course to provide additional WWTP effluent for irrigation purposes	\$484,926	495		2010	NA	San Jacinto	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	0	1	0	0	1	0	0	0	0	2	No	No			
SJRA WRAP	Montgomery County	Conversion of Montgomery County to surface water. Also includes reuse and major water supply infrastructure.	\$900,000,000 capital cost for WWP, \$217,856,853 infrastructure cost for participating WUGs / GRP participation)	\$849. (WWP cost only - excludes infrastructure cost of customer WUGs / GRP participation)		2020 (2015)	NA	San Jacinto	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	0	1	0	0	1	0	0	0	0	1	No	No			
Sugar Land GRP	Sugar Land	Conversion of Sugar Land and surrounding area to surface water. Also includes reuse.	\$161,360,000 capital cost for WWP, \$6,360,100 infrastructure cost for participating WUGs / GRP participation)	\$1,234. (WWP cost only - excludes infrastructure cost of customer WUGs / GRP participation)		2020 (2013)	NA	Brazos, San Jacinto-Brazos	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	0	1	0	0	1	0	0	0	0	1	No	No			
WHCRWA GRP	WHCRWA	Conversion of WHCRWA to surface water. Also includes reuse and major water supply infrastructure.	\$3,249,000 infrastructure cost for participating WUGs. WWP infrastructure detailed separately.	See WHCRWA Transmission and WHCRWA Internal Distribution.		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	1	0	0	1	0	0	0	0	0	2		Yes			
Infrastructure Strategies																											
BWA Brackish Groundwater	BWA	Desalinate or brackish groundwater from Gulf Coast Aquifer to enhance the yield of surface water sources in use in the lower Brazos River Basin.	\$30,570,395	\$390-594		2020	3,136	Multiple	No	Increased return flows form groundwater development and RO concentrate.	Limited disturbance outside of existing plant area.	-1	0	1	0	0	1	0	1	0	0	2	No	No			
BWA Plant Expansion	BWA	Expansion of BWA's conventional SWTP to enhance the yield of surface water sources in use in the lower Brazos River Basin.	\$14,359,419	\$432		2020	NA	Multiple	No	Potential disturbance due to construction.	No disturbance outside of existing plant area. Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	0	1	0	0	1	1	0	0	2	No	No				
CHCRWA Transmission	CHCRWA	Transmission capacity development	\$8,737,162	\$78		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	1	0	1	0	0	1	0	0	0	3	No	No				
CHCRWA Distribution	CHCRWA	Distribution capacity development	\$11,283,234	\$101		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	0	1	0	0	1	0	0	0	2	No	No				
NFBWA Shared Transmission Line	NFBWA	Transmission capacity development	\$213,000,000 capital cost	\$150		2020 (2013)	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	0	0	1	0	0	1	0	0	0	2	No	No				
NFBWA Internal Distribution	NFBWA	Distribution capacity development	\$225,000,000 capital cost	\$85		2020 (2013)	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	1	0	1	0	0	1	0	0	0	3	No	No				
NHCRWA Transmission	NHCRWA	Transmission capacity development	\$253,249,100 capital cost	\$106		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant	0	0	1	0	0	1	0	0	0	2	No	No				

Region H
Table 4A-3: Water Management Strategy Screening

Water Management Strategy	Water User Group or Wholesale Provider	Strategy Description	Strategy Capital Cost (\$)	Average Annual Cost of Water (\$/ac-ft)	Major WWS	Earliest Potential Starting Decade	Firm Yield (ac-ft/yr)	Basin	Interbasin Transfer (Yes/No)	Impacts on Habitat / Stream / B&E Flows	Impacts on Landform	Decision Matrix Factors (High, Medium, Low)										Total of Screening Factors	Selected as Part of 2001 Plan	Selected as Part of 2006 Plan			
												Cost	Yield	Location	Water Quality	Environment	Local Preference	Institutional Constraints	Risk of Implementation	Impacts on Water Resources	Impacts on Other Management Strategies						
Screening Factor Weight:												1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NHCRWA Internal Distribution	NHCRWA	Distribution capacity development	\$535,881,400 capital cost	\$222		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant	-1	0	1	0	0	1	0	0	0		1	No	No			
WHCRWA Transmission	WHCRWA	Transmission capacity development	\$290,084,200 capital cost	\$178		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant	0	0	1	0	0	1	0	0	0		2	No	No			
WHCRWA Internal Distribution	WHCRWA	Distribution capacity development	\$552,472,000 capital cost	\$338		2010	NA	Multiple	Yes (previously permitted)	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant	-1	0	1	0	0	1	0	0	0		1	No	No			
West Chambers County Supply System	CLCND	Develop a surface water supply system to meet demands in western Chambers County with water from the Trinity basin.	\$20,380,000	\$408		2020	NA	Sabine to San Jacinto	Yes (previously permitted)	Potential introduction of invasive species		-1	0	1	0	0	1	0	0	0		1	No	No			
COH Treatment Expansion	Houston	Increasing capacity in COH treatment facilities infrastructure.	\$2,045,672,200 capital cost	\$1,003		Various	NA	Trinity-San Jacinto, San Jacinto, San Jacinto-Brazos, Brazos	No	Footprint of facilities largely already developed.	Footprint of facilities largely already developed.	-1	1	1	0	0	1	0	0	1		3	No	No			
COH Distribution Expansion	Houston	Distribution expansion for WWP	\$261,040,000	TBD		2010 (2011)	NA	San Jacinto	No	Footprint of facilities largely already developed.	Footprint of facilities largely already developed.		1	0	0	0	1	0	0	1		3	No	No			
Huntsville WTP	Huntsville	WTP construction to utilize existing contracts	\$61,023,900 capital cost (estimated using Region H standard cost assumptions).	\$587		2010	NA	Trinity, San Jacinto	No	Potential disturbance due to construction.	Temporary disturbance due to transmission line construction. Land required for plant construction/expansion	-1	1	1	0	0	1	0	0	0		2	No	No			
LLWSSSC Surface Water Project	Lake Livingston Water Supply and Sewer Service Company	Expansion of SWTP to meet municipal demands	\$3,087,974	\$373		2010	NA	Trinity	No	Potential disturbance due to construction.	Land required for facility construction	-1	1	1	0	0	1	0	-1	0		1	No	No			
Harris County MUD 50 SWTP	Harris MUD 50	Treat surface water from SJRA for municipal use.	\$6,131,600	\$736		2020	NA	San Jacinto	No	Potential disturbance due to construction.	Land required for facility construction	-1	1	1	0	0	1	0	-1	0		1	No	No			
Luce Bayou	COH	Development of a conveyance from the Trinity River to Lake Houston	\$253,917,000 capital cost	\$91		2020	NA	Trinity to San Jacinto	Yes (previously permitted)	Potential introduction of invasive species	Conveyance requires extensive canal construction	1	0	1	0	-1	1	-1	-1	0		0	Yes	Yes			
Sealy GW Treatment Expansion	Sealy	Expansion of a SWTP	\$6,450,000	\$966		2020	NA	Brazos	No	Potential disturbance due to construction.	Land required for facility construction	-1	1	1	0	0	1	0	-1	0		1	No	No			
Pearland SWTP	Pearland	Installation of a SWTP	\$265,000,000	\$848		2010	NA	San Jacinto - Brazos	No	Potential disturbance due to construction.	Land required for facility construction	-1	1	1	0	0	1	0	-1	0		1	No	No			
Reservoir Strategies																											
Allens Creek Reservoir	BRA / Houston	New reservoir in Austin County	\$222,752,400	\$197	Y	2020	99,650	Brazos	No	Wetlands and bottomland hardwoods impacted	Innundates 7,000 acres	0	0	1	1	-1	1	0	-1	1		2	Yes	Yes			
Bedias Reservoir	SJRA	New Reservoir in Madison/Grimes Counties	\$247,241,628	\$237	Y	2030	90,700	Trinity	No	7,300 acres of bottomland hardwoods	Innundates 27,400 acres	0	0	0	0	-1	0	-1	-1	-1		-4	Yes	No			
Dow Off-Channel Reservoir and Pump Station Expansion	Dow / Brazosport Water Authority	Increase total raw water pumping and storage capacity	\$226,837,000	\$256	Y	2020	80,000	Brazos	No	Potential habitat impacts to 2,000 acres. Impacts potentially already incurred due to agricultural use	Impacts to 2,000 acres of agricultural land.	-1	1	1	0	0	0	1	-1	0		1	No	No			
Little River Reservoir	BRA / GCWA	New reservoir in Milam County	\$556,520,000	\$328	Y	2040	119,000	Brazos	No	Listed and endangered species habitat	Innundates 35,600 acres	-1	0	0	0	-1	-1	-1	-1	0		-5	Yes	No			
Little River Off-Channel Reservoir	BRA	New reservoir in Milam County	\$137,356,000	\$436	Y	2040	27,255	Brazos	No	Potential impact on terrestrial species habitats	Innundates 4,400 acres	-1	-1	0	0	0	0	0	-1	1		-2	No	Yes			
Brazoria Off-Channel Reservoir	Brazoria County	New reservoir in Brazoria County	\$173,898,602	\$1,206	Y	2030	24,000	San Jacinto - Brazos	No	Potential impact on terrestrial species habitats	Innundates 3,200 acres	-1	1	1	0	0	1	0	-1	0		1	No	No			
Fort Bend Off-Channel Reservoir	Fort Bend County	New reservoir in Fort Bend County	\$202,514,788	\$1,893 (based on allocated volume)	Y	2030	46,000	San Jacinto - Brazos	No	Potential impact on terrestrial species habitats	Innundates 3,000 acres	-1	1	1	0	0	1	0	-1	0		1	No	No			
GCWA Off-Channel Reservoirs	GCWA	Use storage to enhance the yield of existing GCWA rights	\$197,448,012	\$827	Y	2030	39,530	San Jacinto - Brazos	No	Potential impact on terrestrial species habitats	Innundates 4,000 acres	-1	1	1	0	0	1	0	-1	0		1	No	No			
Lower Lake Creek Reservoir	SJRA	New reservoir in Montgomery County	\$480,777,860	\$583	Y	2040	67,200	San Jacinto	No	Innundates about 13,100 acres including 2,200 acres of bottomland hardwoods, 7,000 acres of oak, hickory, and pine forest, and 1,800 acres of shrubland and grasses. Some Endangered Species Identified	There are about 2,200 acres of bottomland hardwoods, 7,000 acres of oak, hickory, pine forest, and 1,800 acres of shrubland and grasses.	-1	1	0	0	-1	0	-1	-1	1		-2	No	No			
Millican Reservoir (Panther Creek Dam)	BRA	New reservoir in Brazos, Madison, Leon, and Robertson Counties	\$1,159,907,000	\$1,241 (allocated portion only - for fully-utilized reservoir, unit cost is \$424 per acre-foot)	Y	2040	194,500	Brazos	No	Some endangered species have been identified. Innundates 71,000 acres. Approximately 17,000 acres of mixed bottomland hardwoods. Probable high environmental impacts.	Innundates 71,000 acres. Approximately 17,000 acres of mixed bottomland hardwoods.	-1	0	-1	0	-1	0	-1	-1	0		-5	No	No			
Millican-Bundic Reservoir	BRA	New reservoir in Brazos, Madison, Leon, and Robertson Counties	\$720,224,000	\$1,431	Y	2030	36,990	Brazos	No	Avoids Manning and Yegua lignite, avoids Kurten oil and gas field, avoids the Wilcox lignite in the upper river reaches and avoids significant bottomland hardwood population. Size of lake would be constrained by the Wilcox lignite, and inundation of marsh area upstream of Old San Antonio Road. Probable moderate to high environmental and instream flows impacts.	The inundation area impacts approximately and 9,210 acres of mixed Bottomland Hardwood Forest, 4,086 acres of Grasses/Forbs, and 1,334 acres of Post Oak Woods.	-1	0	-1	0	-1	0	-1	-1	0		-5	No	No			
Reuse Strategies																											

Region H
Table 4A-3: Water Management Strategy Screening

Water Management Strategy	Water User Group or Wholesale Provider	Strategy Description	Strategy Capital Cost (\$)	Average Annual Cost of Water (\$/ac-ft)	Major WMS	Earliest Potential Starting Decade	Firm Yield (ac-ft/yr)	Basin	Interbasin Transfer (Yes/No)	Impacts on Habitat / Stream / B&E Flows	Impacts on Landform	Decision Matrix Factors (High, Medium, Low)										Total of Screening Factors	Selected as Part of 2001 Plan	Selected as Part of 2006 Plan		
												Coast	Yield	Location	Water Quality	Environment	Local Preference	Institutional Constraints / Risk of Implementability	Impacts on Water Resources / Other Management Strategies							
Fulshear Reuse	Fulshear	Development of a direct reuse system to provide reclaimed water to Fulshear and surrounding communities.	\$566,600 capital cost (estimated as \$564 per acre-foot construction cost based on Wastewater Reuse for Municipal Irrigation WMS).	\$502		2020	430	Brazos, San Jacinto-Brazos	No	Reduces return flows to Upper Galveston Bay, offset by reduced diversions from the Trinity Basin.	None	-1	0	1	1	0	1	0	-1	0	1	No	No			
GCWA Reclaimed Water from City of Houston	GCWA	Transfer of reclaimed water from COH SSWWTP and upstream plants.	\$66,840,500	\$80	Y	2020	56,896	Brazos, San Jacinto-Brazos	Yes	Reduces return flows to Upper Galveston Bay.	Primarily developed in existing corridor.	0	1	-1	0	1	0	0	-1	0	0	No	No			
Houston Indirect Wastewater Reuse	Houston	Reuse wastewater from all city WWTPs in lieu of Trinity Supply.	\$721,822,900 infrastructure cost for participating WUGs.	\$402 to \$1,232 per ac-ft (\$777 average)	Y	2020	Up to 490,223	San Jacinto	No	Reduces return flows to Upper Galveston Bay, offset by reduced diversions from the Trinity Basin.	Size and location of diversion pump stations still TBD.	0	1	1	0	0	0	-1	-1	1	1	Yes	Yes			
Montgomery County MUDs 8/9 Reuse	Montgomery MUDs 8/9	Reuse water from Montgomery County MUDs 8/9	\$12,245,700	\$878 per acre-foot (based on allocated volume)		2020 (2016)	1,120 (max)	San Jacinto	No	This WMS will not be permitted to negatively impact downstream rights.	none	-1	1	1	0	1	1	0	0	0	3	No	No			
NHCRWA Indirect Wastewater Reuse	NHCRWA	Reuse wastewater from member WWTPs in lieu of purchasing additional supply.	\$66,778,694	\$702 per acre-foot allocated	Y	2010	Up to 157,000	San Jacinto	No	Reduces return flows to Upper Galveston Bay, offset by reduced diversions from the Trinity Basin.	Size and location of diversion pump stations still TBD.	0	1	1	0	0	0	-1	-1	1	1	Yes	Yes			
Wastewater Reclamation for Industry	Houston, Manufacturing	Deliver treated wastewater to industry for use in lieu of Trinity River supply.	\$332,051,761	\$893	Y	2010	67,200	San Jacinto	No	Minimal change in habitat	None	-1	1	1	1	0	1	0	1	1	5	Yes	Yes			
Wastewater Reclamation for Municipal Irrigation	County-Other and Authorities in Brazoria, Fort Bend, Harris, and Montgomery Counties	Reuse for municipal irrigation	\$48,043,200 infrastructure cost for participating WUGs.	\$539 average		2030	36,388 (in 2060)	Multiple	No	Reduces return flows to Upper Galveston Bay, offset by reduced diversions from the Trinity Basin.	None	-1	0	1	1	0	1	0	-1	0	1	No	No			
Permit Strategies																										
BRA System Operations Permit	BRA	Use peak flows, when available, and systems management to reduce the use of water stored under other permits.	TBD – based on system rate of \$61 per acre-foot	TBD – based on system rate of \$61 per acre-foot	Y	2020 (2015)	25,350 (Region H)	Brazos	No	Harvests peak flows through system management, positive affect on below-median flows	New pump stations may be required.	1	1	1	0	0	1	-1	0	0	3	Yes	Yes			
Houston Bayous Permit	Houston	Use peak flows, when available, to reduce the use of water stored under other permits.	\$20,956,000	System rate		NA	0	San Jacinto	No	Reduces return flows to Upper Galveston Bay, offset by reduced diversions from the Trinity Basin.	Size and location of diversion pump stations still TBD.	1	-1	1	0	-1	1	-1	0	0	0	Yes	Yes			
Other Strategies																										
Brazoria County Interruptible Supplies for Irrigation	GCWA	Use of interruptible portion of GCWA water right for irrigation	NA	NA		2010	Non-firm 124,000 64,000 w/ GCWA off-channel	Brazos, San Jacinto-Brazos	No	Reduced flows in Brazos River due to increased diversion	None	1	1	1	0	0	0	0	-1	0	2	NA	NA			
Brazos Salt Water Barrier	BRA / DOW	Prevent the seasonal migration of the saltwater wedge upstream to protect existing diversion points.	\$44,470,700	NA		2030	NA	Brazos	No	Will influence flood plain response to major storms.	New structure in river channel	0	-1	1	1	0	0	0	1	1	3	NA	Yes			
Freeport Desalination	BRA / DOW	Desalinate seawater for industrial and municipal use.	\$85,233,000 (11,200AF) - \$255,699,000 (33,600AF)	\$1,730 to \$2,376	Y	2040	11,200 to 33,600	Brazos, San Jacinto-Brazos	No	Offsets some use of Brazos basin flows.	New facility may require some land clearing.	-1	1	1	1	0	0	0	0	0	2	No	Yes			
Montgomery County MUD 8/9 Brackish Desal	Montgomery County MUDs 8 and 9	Development of a brackish groundwater desalination facility that would supplement existing wells, reducing dependence on fresh water formations of the Gulf Coast Aquifer.	TBD	TBD		2010 (2014)	Up to 2,240 acre-feet per year (average 2.0 MGD)	San Jacinto	No	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No	No			
Sabine to Region H Transfer	Harris / Montgomery Counties	Transfer existing supply from Toledo Bend Reservoir to Region H.	\$760,813,320		Y	2030	From 26,762 (2020) to 486,500 (2060)	Sabine to San Jacinto	Yes	Potential introduction of invasive species / Reduction of freshwater inflows to Sabine Lake	1398-acres	0	1	-1	0	-1	-1	-1	-1	1	-3	NA	No			
Galveston County Desal	GCWA		TBD	TBD				San Jacinto-Brazos			Unknown	-1	0	1	1	0	0	0	0	0	1	No	No			

Attachment D:

Amended Table 4A-6: Decadal WMS Summary

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Attachment E:

Amended Technical Memorandum 4B-17: Transmission Line to CHRWA Municipal WUG and WWP

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REGION H WATER MANAGEMENT STRATEGY ANALYSIS TECHNICAL MEMORANDUM

STRATEGY TITLE: Transmission Line to CHCRWA Municipal WUG and WWP

DATE: September 3, 2009

SUMMARY

STRATEGY DESCRIPTION: The transmission of Lake Houston surface water supplies via the Northeast Water Purification Plant (NEWPP) to the Central Harris County Regional Water Authority (CHCRWA) to meet projected shortages.

SUPPLY QUANTITY: Approximately 4,800 acre-feet per year (CHCRWA Portion Only). Note that this is not a new supply but rather represents conveyance of a volume reflected under other WMS.

SUPPLY SOURCE: Surface water from Lake Houston and Lake Livingston via NEWPP.

IMPLEMENTATION DECADE: 2010 – Greens Road Transmission line, Phase I and Major Distribution Infrastructure

TOTAL STRATEGY COST: \$8,737,162 capital cost, transmission
\$11,283,234 capital cost, distribution

UNIT WATER COST: \$78 per acre-foot for transmission
\$101 per acre-foot for distribution

Water Management Strategy Analysis Description

Introduction:

The Authority was created in 2005 to prepare and implement a plan to construct and operate the necessary public water transmission facilities to convert an area in central Harris County, Texas, comprised of eleven (11) conservation and reclamation districts from groundwater to surface water. The Authority will wholesale treated surface water to connected participants. Surface water will be purchased from the City of Houston (COH) and is conveyed to participants' water plant facilities.

Analysis:

To meet the 2010 to 2019 water demands, the COH will provide a transmission line from the NEWPP to the intersection of the Sam Houston Toll Road (Beltway 8) and US 59 (Eastex Freeway). The North Harris County Regional Water Authority (NHCRWA) will connect at this point and construct its own transmission line. The transmission line will be a 60-inch diameter pipe traveling through easements north to Greens Road. At Greens Road, the pipeline will be constructed in the right-of-way of Greens Road. The pipeline would then turn north to meet the Spears Road Regional Pump Station, where the water will discharge into groundwater storage tanks at a proposed pump station. The 2020 through 2030 proposed transmission system, from the NEWPP to the proposed pump stations, will convey only water for wholesale customers within the NHCRWA.

CHCRWA is also responsible for the construction of a transmission line to the take point from the NHCRWA transmission line and secondary surface water transmission system to its member districts. In order to secure treated capacity, the CHCRWA will participate in the Northeast Water Purification Plant (NEWPP) for a portion equal to their need for treated surface water.

Water User Group Application:

The water conveyed into the San Jacinto River Basin through this strategy would meet all projected shortages in CHCRWA throughout the planning period. The Greens Road transmission line will be completed in a cost sharing program with North Harris County Regional Water Authority. The preliminary estimate of capital costs are shown in *Tables 1* and 2. Costs for engineering, financial, and legal services, land acquisition, and environmental costs are assumed to be included in the capital cost provided by the strategy sponsor.

**Table 1
CHCRWA Transmission Cost Summary**

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PROJECT COST SUMMARY					
1	CONSTRUCTION (CAPITAL) COST	1	LS	\$8,030,000	\$8,030,000
2	ENGINEERING, FINANCIAL, AND LEGAL SERVICES AND CONTINGENCIES	1	LS	\$0	\$0
3	LAND AND EASEMENTS	1	LS	\$0	\$0
4	ENVIRONMENTAL - STUDIES AND MITIGATION	1	LS	\$0	\$0
5	INTEREST DURING CONSTRUCTION	1	LS	\$707,162	\$707,162
PROJECT COST					\$8,737,162

ITEM	DESCRIPTION	ANNUAL TOTAL					
ANNUAL COST SUMMARY		2010	2020	2030	2040	2050	2060
1	DEBT SERVICE	\$761,746	\$761,746	\$0	\$0	\$0	\$0
2	OPERATION AND MAINTENANCE (O&M)	\$80,300	\$80,300	\$80,300	\$80,300	\$80,300	\$80,300
3	PUMPING ENERGY COSTS	\$0	\$0	\$0	\$0	\$0	\$0
4	PURCHASE COST OF WATER	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL ANNUAL COST		\$842,046	\$842,046	\$80,300	\$80,300	\$80,300	\$80,300

ITEM	DESCRIPTION	ANNUAL TOTAL					
ANNUAL COST SUMMARY		2010	2020	2030	2040	2050	2060
1	ANNUAL COST	\$842,046	\$842,046	\$80,300	\$80,300	\$80,300	\$80,300
2	YIELD	2,375	4,146	4,789	4,806	4,806	4,806
3	UNIT COST	\$355	\$203	\$17	\$17	\$17	\$17
TOTAL UNIT COST		\$78					

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONSTRUCTION COST SUMMARY					
1	PIPELINES	1	LS	\$8,030,000	\$8,030,000
PROJECT COST					\$8,030,000

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPERATION AND MINTENANCE (O&M) COST SUMMARY					
1	PIPELINES	1.0	%	\$8,030,000	\$80,300
ANNUAL OPERATION AND MAINTENANCE COST					\$80,300

**Table 2
CHCRWA Distribution Cost Summary**

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PROJECT COST SUMMARY					
1	CONSTRUCTION (CAPITAL) COST	1	LS	\$10,370,000	\$10,370,000
2	ENGINEERING, FINANCIAL, AND LEGAL SERVICES AND CONTINGENCIES	1	LS	\$0	\$0
3	LAND AND EASEMENTS	1	LS	\$0	\$0
4	ENVIRONMENTAL - STUDIES AND MITIGATION	1	LS	\$0	\$0
5	INTEREST DURING CONSTRUCTION	1	LS	\$913,234	\$913,234
PROJECT COST					\$11,283,234

ITEM	DESCRIPTION	ANNUAL TOTAL					
ANNUAL COST SUMMARY							
		2010	2020	2030	2040	2050	2060
1	DEBT SERVICE	\$983,724	\$983,724	\$0	\$0	\$0	\$0
2	OPERATION AND MAINTENANCE (O&M)	\$103,700	\$103,700	\$103,700	\$103,700	\$103,700	\$103,700
3	PUMPING ENERGY COSTS	\$0	\$0	\$0	\$0	\$0	\$0
4	PURCHASE COST OF WATER	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL ANNUAL COST		\$1,087,424	\$1,087,424	\$103,700	\$103,700	\$103,700	\$103,700

ITEM	DESCRIPTION	ANNUAL TOTAL					
ANNUAL COST SUMMARY							
		2010	2020	2030	2040	2050	2060
1	ANNUAL COST	\$1,087,424	\$1,087,424	\$103,700	\$103,700	\$103,700	\$103,700
2	YIELD	2,375	4,146	4,789	4,806	4,806	4,806
3	UNIT COST	\$458	\$262	\$22	\$22	\$22	\$22
TOTAL UNIT COST							\$101

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONSTRUCTION COST SUMMARY					
1	PIPELINES	1	LS	\$10,370,000	\$10,370,000
PROJECT COST					\$10,370,000

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPERATION AND MINTENANCE (O&M) COST SUMMARY					
1	PIPELINES	1.0	%	\$10,370,000	\$103,700
ANNUAL OPERATION AND MAINTENANCE COST					\$103,700

Issues and Considerations:

Although the supply infrastructure (Lake Houston via NEWPP) is in place, the conveyance required for this transfer is not. The NHCRWA transmission lines or similar transmission lines must be constructed to move this supply into the San Jacinto River Basin.

References:

North Harris County Regional Water Authority Groundwater Reduction Plan, Central Harris County Regional Water Authority, May 2003

“Texas Water Development Board Approves \$22,050,000 Loan to the Central Harris County Regional Water Authority for Water Project Construction.” TWDB Press Release, <http://www.twdb.state.tx.us>, March 25, 2008, accessed July 9, 2009.

Attachment F:

Amended Table 4C-1: WWP-Level Project Costs

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Region H
Table 4C-1: WWP-Level Project Cost

WMS	Total Capital Cost	Total Annual Costs (\$/year)					Source	Notes
		2010	2020	2030	2040	2050		
Contractual Strategies								
BRA to Brazosport Water Authority Contract - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
BRA to GCWA Contract - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
BRA to GCWA Contract - Brazos Main Stem System	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
BRA to GCWA Contract - Fort Bend OCR	\$0	\$0	\$0	\$0	\$0	\$0		
BRA to GCWA Contract - SysOps Supply	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
BRA to NRG Contract - Fort Bend OCR	\$0	\$0	\$0	\$0	\$0	\$0		
BRA to Richmond-Rosenberg Contract - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0		
BRA to Richmond-Rosenberg Contract - Fort Bend OCR	\$0	\$0	\$0	\$0	\$0	\$0		
BRA to Sugar Land - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0		
BRA to Sugar Land - Fort Bend OCR	\$0	\$0	\$0	\$0	\$0	\$0		
BRA to Sugar Land - SysOps Supply	\$0	\$0	\$0	\$0	\$0	\$0		
COH to Baytown Area Water Authority - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to BRA Contract - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to CHCRWA Contract - Lake Houston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to CHCRWA Contract - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to City of Pasadena Contract - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to GCWA Contract	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2016 RWP analysis	Costs listed under GCWA Reclaimed Water from COH WMS.
COH to NFBWA Contract - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to NHRWA Contract - Houston Indirect Reuse	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to NHRWA Contract - Lake Houston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to NHRWA Contract - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to North Channel Water Authority Contract - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
COH to SJRA Contract - Lake Conroe	\$0	\$0	\$0	\$0	\$0	\$0		
COH to WHCRWA Contract - Lake Livingston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to City of Galveston Contract - Brazos Main Stem System	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to City of Galveston Contract - Brazos Run-of-River	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to City of Galveston Contract - San Jacinto-Brazos Run-of-River	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Fort Bend County WCID #2 Contract - SysOps Supply	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Galveston County WCID #1 Contract - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Galveston County WCID #1 Contract - Brazos Main Stem System	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Galveston County WCID #1 Contract - Brazos Run-of-River	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Galveston County WCID #1 Contract - San Jacinto-Brazos Run-of-River	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Missouri City Contract - Allens Creek	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
GCWA to Missouri City Contract - Fort Bend OCR	\$0	\$0	\$0	\$0	\$0	\$0		
GCWA to Missouri City Contract - SysOps Supply	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
SJRA to COH Contract - Lake Houston	\$0	\$0	\$0	\$0	\$0	\$0	Region H 2011 RWP	No cost as infrastructure reflected under other strategies. Raw water cost not assumed.
TRA to Houston Transfer	\$0	\$0	\$0	\$0	\$0	\$0	Region H RWP Tech Memo	Strategy cost associated with Luce Bayou
TRA to SJRA Transfer	\$302,781,597	\$0	\$0	\$0	\$37,101,862	\$37,101,862	Region H RWP Tech Memo	Cost associated with development of conveyance infrastructure.
Groundwater Reduction Plans								
CHCRWA GRP	\$0	\$0	\$0	\$0	\$0	\$0	IDS Engineering Group	No cost as volume and treatment / distribution is associated with other strategies.
COH GRP	\$0	\$0	\$0	\$0	\$0	\$0	Region H RWP Tech Memo - Treatment	No cost as volume and treatment / distribution is associated with other strategies.
Fort Bend WCID #2 GRP	\$24,828,857	\$0	\$1,310,164	\$2,312,320	\$2,387,576	\$1,768,681	FBC WCID 2 GRP	Annual O&M includes electric cost
NFBWA GRP	\$0	\$0	\$0	\$0	\$0	\$0	NFBWA GRP	No cost as volume and treatment / distribution is associated with other strategies.
NHRWA GRP	\$0	\$0	\$0	\$0	\$0	\$0	NHRWA GRP	No cost as volume and treatment / distribution is associated with other strategies.
Missouri City GRP	\$92,070,990	\$0	\$5,750,635	\$10,328,943	\$5,859,820	\$2,301,775	Missouri City GRP	Annual O&M cost assumed as 2.5% of project capital cost. No annual energy cost assumed due to limited information.
Richmond Rosenberg GRP (WFB SWTP)	\$117,220,150	\$0	\$6,652,597	\$13,441,309	\$16,083,787	\$13,471,435	West FBC Regional SWTP PER	
SJRA WRAP	\$900,000,000	\$0	\$42,630,132	\$62,823,352	\$52,130,132	\$52,142,749	SJRA WRAP Part 2	Annual costs beyond debt service estimated from SJRA WRAP Part II. O&M costs include electricity.
Sugar Land GRP	\$161,360,049	\$0	\$17,561,104	\$17,561,104	\$3,493,000	\$3,493,000	Sugar Land CIP, Sugar Land GRP	Assuming O&M constant after 2014. No annual energy cost assumed due to limited information.
WHCRWA GRP	\$0	\$0	\$0	\$0	\$0	\$0	WHCRWA Summary	No cost as volume and treatment / distribution is associated with other strategies.
Reservoir Strategies								
GCWA Reclaimed Water from COH	\$66,840,044	\$0	\$7,912,181	\$7,912,181	\$2,319,051	\$2,319,051	Region H 2016 RWP analysis	
Allens Creek Reservoir	\$222,752,400	\$0	\$18,706,144	\$18,706,144	\$18,706,144	\$18,706,144	Region H RWP Tech Memo	
Brazoria Off-Channel Reservoir	\$173,898,602	\$0	\$0	\$0	\$0	\$0		
Dow Off-Channel Reservoir and Pump Station Expansion	\$226,837,000	\$0	\$20,306,000	\$20,306,000	\$20,306,000	\$14,405,000	Dow and HDR, Inc.	
Fort Bend Off-Channel Reservoir	\$202,514,788	\$0	\$0	\$0	\$0	\$43,566,686		
GCWA Off-Channel Reservoir	\$197,448,012	\$0	\$0	\$32,678,970	\$32,678,970	\$32,678,970	Region H 2011 RWP	
Reuse Strategies								
Wastewater Reuse for Industry	\$332,051,761	\$0	\$0	\$0	\$0	\$60,010,614	Region H RWP Tech Memo	
Permit / Other Strategies								
BRA System Operations Permit	\$0	\$0	\$0	\$0	\$0	\$0	HDR, Inc.	
Freeport Desalination	\$255,699,000	\$0	\$0	\$0	\$28,685,479	\$28,685,479	Region H 2011 RWP	Assuming O&M as 2.5 percent of capital cost. No annual energy cost assumed due to limited information.
Houston Bayous Permit	\$20,956,000	\$0	\$1,827,040	\$1,827,040	\$0	\$0	Region H RWP Tech Memo	
Infrastructure Strategies								
BWA Brackish Groundwater	\$30,570,395	\$0	\$5,735,790	\$5,735,790	\$3,177,681	\$3,177,681	CDM Smith	Based on anticipated operation.
BWA Plant Expansion	\$14,359,419	\$0	\$3,274,279	\$3,274,279	\$2,072,693	\$2,072,693	SDM Smith	Based on peak capacity.
Brazos Saltwater Barrier	\$44,470,739	\$0	\$4,988,930	\$4,988,930	\$1,111,768	\$1,111,768	Region H RWP Tech Memo	Annual O&M cost assumed as 2.5% of project capital cost. No annual energy cost assumed due to limited information.
CHCRWA Transmission	\$0	\$842,046	\$842,046	\$80,300	\$80,300	\$80,300	IDS Engineering Group	Annual O&M cost assumed as 1.0% of project capital cost. No annual energy cost assumed due to limited information.
CHCRWA Internal Distribution	\$0	\$1,087,424	\$1,087,424	\$103,700	\$103,700	\$103,700	IDS Engineering Group	Annual O&M cost assumed as 1.0% of project capital cost. No annual energy cost assumed due to limited information.
CLCND West Chambers County System	\$20,380,000	\$0	\$1,980,621	\$1,980,621	\$203,800	\$203,800	CLCND Funding App	Annual O&M cost assumed as 1.0% of project capital cost. No annual energy cost assumed due to limited information.
COH Treatment Expansion	\$2,045,672,161	\$7,670,034	\$121,707,226	\$168,015,257	\$109,009,300	\$89,583,305	\$89,583,305	Estimated using Reg H procedures
COH Distribution Expansion	\$261,040,000	\$0	\$22,293,166	\$25,369,057	\$5,369,791	\$2,610,400	\$2,610,400	No data available
Huntsville WTP	\$61,023,908	\$10,120,710	\$10,120,710	\$4,800,368	\$4,800,368	\$4,800,368	\$4,800,368	Standard Region H assumptions
Luce Bayou	\$253,916,914	\$0	\$31,798,394	\$31,798,394	\$9,660,760	\$9,660,760	Luce Bayou Alternatives Analysis	O&M and electric scaled using CCI
NFBWA 2025 Shared Transmission (w/ WHCRWA)	\$213,000,000	\$0	\$1,220,584	\$13,600,791	\$17,349,727	\$4,969,520	\$0	NFBWA Table from BGE
NFBWA Internal Distribution	\$225,000,000	\$6,451,657	\$7,759,425	\$10,549,331	\$10,113,409	\$1,743,692	\$1,743,692	NFBWA Table from BGE
NHRWA Internal 2010 Distribution	\$153,149,640	\$14,883,780	\$14,883,780	\$1,531,496	\$1,531,496	\$1,531,496	\$1,531,496	
NHRWA Internal 2020 Distribution	\$345,292,192	\$0	\$33,557,069	\$33,557,069	\$3,452,922	\$3,452,922	\$3,452,922	
NHRWA Internal 2030 Distribution	\$37,439,584	\$0	\$0	\$3,638,549	\$3,638,549	\$374,396	\$374,396	
NHRWA Transmission 2010	\$80,690,624	\$7,841,883	\$7,841,883	\$806,906	\$806,906	\$806,906	\$806,906	
NHRWA Transmission 2020	\$172,558,512	\$0	\$16,770,023	\$16,770,023	\$1,725,585	\$1,725,585	\$1,725,585	
NHRWA Transmission 2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
WHCRWA Internal Distribution	\$552,472,000	\$13,149,945	\$46,238,371	\$41,894,891	\$12,211,165	\$5,524,720	\$5,524,720	WHCRWA Summary
WHCRWA 2020 Shared Transmission (w/ NFBWA)	\$290,084,193	\$4,384,014	\$28,191,704	\$24,258,792	\$2,900,842	\$2,900,842	\$2,900,842	WHCRWA Summary
Alternative Strategies								

Attachment G:

Summary of database entries anticipated for DB12

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DB12 Entries: CHCRWA Transmission Line and CHCRWA Internal Distribution

WMS Project

Sponsor Region:	H
WMS Project ID:	H23-CHCTR
WMS Project Name:	CHCRWA TRANSMISSION LINE
WMS Description:	CHCRWA transmission line
WMS Type:	E : EXISTING SOURCE OR EXPANDED USE OF AN EXISTING SOURCE (SURFACE WATER OR GROUNDWATER)
WMS Infrastructure:	PIPELINE
Additional RWPGs:	None
Included in State Water Plan:	Y

Source

Source Region	Source Name	County Name	Basin Name	Source ID	Source Type
H	USTON LAKE/RESERVOIR	RESERVOIR	SAN JACINTO	10030	SW
Is Source Supply selected for Rollup?				Y	
Is Source Cost selected for Rollup?				Y	

County Name:	RESERVOIR	Water Quality Improvements	: NO WATER QUALITY IMPROVEMENTS
County ID:	999	Online Data	2010
Basin Name:	SAN JACINTO	WMS Funding Date	2010
Basin ID:	10		
Include in State Water Plan?			Y
Include WMS Source Total Yield numbers in WMS Project Total Yield Rollup?			Y
Include WMS Source Cost numbers in WMS Project Cost Rollup?			Y

Sponsor Region:	H	WWP Name:					
		CENTRAL HARRIS COUNTY REGIONAL WATER AUTHORITY					
		2010:	2020:	2030:	2040:	2050:	2060:
Total Strategy Supply Volume for this WWP:		2,375	3,352	3,237	3,095	3,006	2,921

Recommendation Type?	Recommended	Is Used to Meet Need?	N	IBT?	N		
Include WWP WMS Cost numbers in WMS Source Cost Rollup?		Y					
WWP WMS Annual Cost:		\$842,046	\$842,046	\$80,300	\$80,300	\$80,300	\$80,300
WWP Capital Costs:		\$8,737,162					
Term of Debt Service:		20					

Source

Source Region	Source Name	County Name	Basin Name	Source ID	Source Type
H	ALLISVILLE LAKE/RESERVOIR	RESERVOIR	TRINITY	084H0	SW
Is Source Supply selected for Rollup?				Y	
Is Source Cost selected for Rollup?				Y	

County Name:	RESERVOIR	Water Quality Improvements	: NO WATER QUALITY IMPROVEMENTS
County ID:	999	Online Data	2020
Basin Name:	TRINITY	WMS Funding Date	2020
Basin ID:	08		
Include in State Water Plan?			Y
Include WMS Source Total Yield numbers in WMS Project Total Yield Rollup?			Y
Include WMS Source Cost numbers in WMS Project Cost Rollup?			Y

Sponsor Region:	H	WWP Name:					
		CENTRAL HARRIS COUNTY REGIONAL WATER AUTHORITY					
		2010:	2020:	2030:	2040:	2050:	2060:
Total Strategy Supply Volume for this WWP:		0	794	1,552	1,711	1,800	1,885

Recommendation Type?	Recommended	Is Used to Meet Need?	N	IBT?	Y		
Include WWP WMS Cost numbers in WMS Source Cost Rollup?		Y					
WWP WMS Annual Cost:		\$0	\$0	\$0	\$0	\$0	\$0
WWP Capital Costs:		\$0					
Term of Debt Service:		20					

DB12 Entries: CHCRWA Transmission Line and CHCRWA Internal Distribution

WMS Project

Sponsor Region:	H
WMS Project ID:	H23-CHCDST
WMS Project Name:	CHCRWA INTERNAL DISTRIBUTION
WMS Description:	CHCRWA internal distribution
WMS Type:	E : EXISTING SOURCE OR EXPANDED USE OF AN EXISTING SOURCE (SURFACE WATER OR GROUNDWATER)
WMS Infrastructure:	PIPELINE
Additional RWPGs:	None
Included in State Water Plan:	Y

Source

Source Region	Source Name	County Name	Basin Name	Source ID	Source Type
H	USTON LAKE/RESERVOIR	RESERVOIR	SAN JACINTO	10030	SW
Is Source Supply selected for Rollup?				Y	
Is Source Cost selected for Rollup?				Y	

County Name:	RESERVOIR	Water Quality Improvements	: NO WATER QUALITY IMPROVEMENTS
County ID:	999	Online Data	2010
Basin Name:	SAN JACINTO	WMS Funding Date	2010
Basin ID:	10		
Include in State Water Plan?			Y
Include WMS Source Total Yield numbers in WMS Project Total Yield Rollup?			Y
Include WMS Source Cost numbers in WMS Project Cost Rollup?			Y

Sponsor Region:	WWP Name:					
H	CENTRAL HARRIS COUNTY REGIONAL WATER AUTHORITY					
	2010:	2020:	2030:	2040:	2050:	2060:
Total Strategy Supply Volume for this WWP:	2,375	3,352	3,237	3,095	3,006	2,921

Recommendation Type?	Is Used to Meet Need?						IBT?
Recommended	N						N
Include WWP WMS Cost numbers in WMS Source Cost Rollup?			Y				
	2010:	2020:	2030:	2040:	2050:	2060:	
WWP WMS Annual Cost:	\$1,087,424	\$1,087,424	\$103,700	\$103,700	\$103,700	\$103,700	
WWP Capital Costs:	\$11,283,234						
Term of Debt Service:	20						

Source

Source Region	Source Name	County Name	Basin Name	Source ID	Source Type
H	ALLISVILLE LAKE/RESERVOIR	RESERVOIR	TRINITY	084H0	SW
Is Source Supply selected for Rollup?				Y	
Is Source Cost selected for Rollup?				Y	

County Name:	RESERVOIR	Water Quality Improvements	: NO WATER QUALITY IMPROVEMENTS
County ID:	999	Online Data	2020
Basin Name:	TRINITY	WMS Funding Date	2020
Basin ID:	08		
Include in State Water Plan?			Y
Include WMS Source Total Yield numbers in WMS Project Total Yield Rollup?			Y
Include WMS Source Cost numbers in WMS Project Cost Rollup?			Y

Sponsor Region:	WWP Name:					
H	CENTRAL HARRIS COUNTY REGIONAL WATER AUTHORITY					
	2010:	2020:	2030:	2040:	2050:	2060:
Total Strategy Supply Volume for this WWP:	0	794	1,552	1,711	1,800	1,885

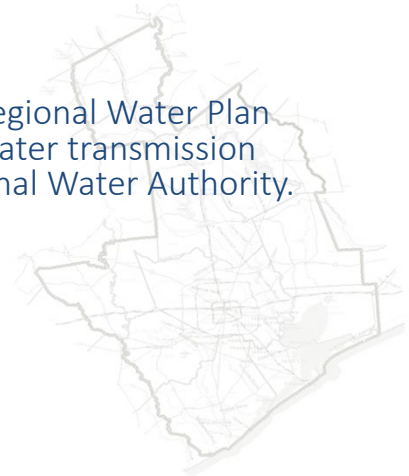
Recommendation Type?	Is Used to Meet Need?						IBT?
Recommended	N						Y
Include WWP WMS Cost numbers in WMS Source Cost Rollup?			Y				
	2010:	2020:	2030:	2040:	2050:	2060:	
WWP WMS Annual Cost:	\$0	\$0	\$0	\$0	\$0	\$0	
WWP Capital Costs:	\$0						
Term of Debt Service:	20						

Agenda Item 8

Consider action to amend the 2011 Region H Regional Water Plan related to development of proposed surface water transmission infrastructure by the Central Harris County Regional Water Authority.

Agenda Item 8 CHCRWA Amendment

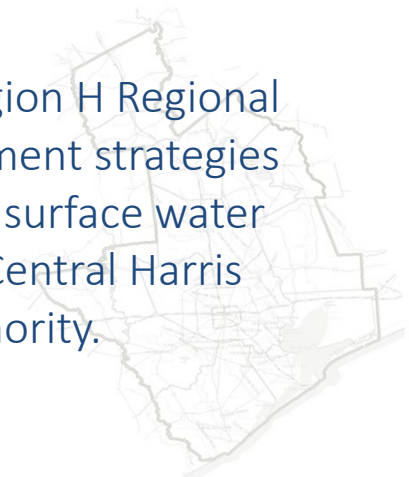
Consider action to amend the 2011 Region H Regional Water Plan related to development of proposed surface water transmission infrastructure by the Central Harris County Regional Water Authority.



Agenda Item 8 CHCRWA Amendment

Action:

Approve amendment of the 2011 Region H Regional Water Plan to include water management strategies related to development of proposed surface water transmission infrastructure by the Central Harris County Regional Water Authority.



Agenda Item 9

Receive presentation from Averitt and Associates regarding Year Two of the Goldwater Study on water conservation in Region H.



REGION H CONSERVATION GOALS

2060 Goals by County in Million Gallons:

Brazoria County	1,277 MG
Fort Bend County	5,704 MG
Galveston County	298 MG
Harris County	21,815 MG
Montgomery County	4,265 MG

TOTAL 33,359 MG

Note: These 5 counties account for 97% of Region H's total goal for 2060.

RESULTS FOR MONTGOMERY COUNTY

- **County needs to achieve 4,265 MG in savings per year by 2060**
 - **12.8% of Region H's total goal**
- **Considerable efforts made by Conroe and The Woodlands (WJPA)**
- **County is currently on pace through 2023**
- **Shifting population trends mean new developments will need to carry a significant load to meet future goals**
- **An evolving reporting process**
 - **A starting place that will continue to include more utilities and account for their efforts**

3

GOLDWATER PROJECT OBJECTIVES

- **Engage cities, MUDs and other utilities to collect their data**
- **Interview to determine current, previous and planned conservation strategies**
- **Use water tracking tool and other methods to quantify and project savings**
- **Provide individual reports that detail utility's share of county goal and how to remain on pace with tailored, cost effective measures**
- **Provide county reports that track progress and make recommendations to meet goals**

4

QUANTIFIABLE SAVINGS

- **Not all measures can be properly measured but are still important!**
- **Project still notes these efforts**
- **Focus is on measures derived from evidence-based studies, field results, manufacturer guarantees and software to put a number to each strategy**
- **Current list totals 34 strategies**

5

SAVINGS PROFILE FOR MONTGOMERY COUNTY

1. **2x Outdoor Watering Restrictions**
2. **W.I.S.E. Guys Audits**
3. **Rain Barrels – Campus and Customer**
4. **Commercial Kitchen Pre-rinse Spray Valve Replacements**

6

ACTUAL SAVINGS

Year #	Year	Conroe Actual Savings	WJPA Actual Savings	Rest of County Actual Savings	Total Actual Savings (MG)	County Goal (MG)	Over (Short)
1	2016	191	274	0	465	54	411
2	2017	197	275	0	472	109	362
3	2018	200	274	0	474	167	307
4	2019	204	273	0	477	226	251
5	2020	208	273	0	481	288	193
6	2021	212	274	0	486	351	136
7	2022	215	276	0	491	416	75
8	2023	218	277	0	495	482	13
9	2024	222	279	0	501	551	(50)
10	2025	226	280	0	506	622	(115)
11	2026	230	282	0	511	694	(183)
12	2027	233	283	0	516	768	(252)
13	2028	237	285	0	521	845	(323)
14	2029	240	287	0	527	923	(396)
15	2030	244	288	0	532	1,002	(471)
16	2031	247	290	0	537	1,084	(548)
17	2032	251	291	0	542	1,168	(626)
18	2033	254	292	0	546	1,253	(707)
19	2034	258	294	0	551	1,341	(789)
20	2035	261	295	0	556	1,430	(873)

2023



7

WITH ADVANCED CONSERVATION MEASURES

Year #	Year	Conroe Actual Savings	WJPA Actual Savings	Rest of County Actual Savings	Conroe + WJPA Total Savings with Advanced Conservation (HIGH)(MG)	County Goal (MG)	Over (Short)
1	2016	191	274	0	506	54	452
2	2017	197	275	0	553	109	444
3	2018	200	274	0	596	167	429
4	2019	204	273	0	640	226	414
5	2020	208	273	0	685	288	397
6	2021	212	274	0	730	351	379
7	2022	215	276	0	776	416	360
8	2023	218	277	0	821	482	339
9	2024	222	279	0	867	551	316
10	2025	226	280	0	913	622	291
11	2026	230	282	0	894	694	200
12	2027	233	283	0	876	768	108
13	2028	237	285	0	857	845	13
14	2029	240	287	0	839	923	(84)
15	2030	244	288	0	821	1,002	(182)
16	2031	247	290	0	803	1,084	(282)
17	2032	251	291	0	784	1,168	(384)
18	2033	254	292	0	765	1,253	(488)
19	2034	258	294	0	747	1,341	(593)
20	2035	261	295	0	729	1,430	(700)

2028



8

NOTE ON ADVANCED CONSERVATION STRATEGIES

- Goldwater Project's 6 recommended strategies based on utility's real data
- Determined to be cost effective using utility's water and wastewater costs
- Savings projected from high implementation levels over a 10-year period
- Utility has complete choice to implement this suite of measures, do less or go above and beyond – we just track progress and continue to provide guidance

9

2X WATERING RESTRICTIONS FOR NEW GROWTH

Year #	Year	Conroe Actual Savings (MG)	WJPA Actual Savings (MG)	County-Other Potential 2x Watering Savings (MG)	Total Potential Savings (MG)	County Goal (MG)	Over (Short)
1	2016	191	274	449	914	54	861
2	2017	197	275	474	946	109	837
3	2018	200	274	500	974	167	807
4	2019	204	273	525	1,002	226	775
5	2020	208	273	550	1,031	288	743
6	2021	212	274	575	1,061	351	710
7	2022	215	276	600	1,091	416	675
8	2023	218	277	625	1,120	482	638
9	2024	222	279	650	1,151	551	600
10	2025	226	280	675	1,181	622	560
11	2026	230	282	701	1,213	694	518
12	2027	233	283	726	1,242	768	473
13	2028	237	285	751	1,273	845	428
14	2029	240	287	776	1,303	923	380
15	2030	244	288	801	1,333	1,002	331
16	2031	247	290	826	1,363	1,084	279
17	2032	251	291	851	1,393	1,168	225
18	2033	254	292	876	1,422	1,253	169
19	2034	258	294	901	1,453	1,341	113
20	2035	261	295	927	1,483	1,430	53
21	2036	265	297	952	1,514	1,521	(7)
22	2037	268	298	977	1,543	1,614	(71)
23	2038	272	300	1,002	1,574	1,708	(134)
24	2039	275	301	1,027	1,603	1,805	(202)
25	2040	279	303	1,052	1,634	1,904	(269)
26	2041	282	305	1,077	1,664	2,004	(340)
27	2042	289	306	1,102	1,697	2,106	(409)
28	2043	293	308	1,127	1,728	2,210	(482)
29	2044	297	310	1,153	1,760	2,316	(557)
30	2045	300	312	1,178	1,790	2,424	(634)

2035



10

2X WATERING RESTRICTIONS FOR ENTIRE COUNTY

Year #	Year	Conroe Actual Savings (MG)	WJPA Actual Savings (MG)	Rest of County Potential 2x Watering Savings (MG)	Total Potential Savings (MG)	County Goal (MG)	Over (Short)
1	2016	191	274	824	1,289	54	1,235
2	2017	197	275	855	1,327	109	1,217
3	2018	200	274	886	1,360	167	1,193
4	2019	204	273	917	1,394	226	1,167
5	2020	208	273	948	1,429	288	1,141
6	2021	212	274	979	1,465	351	1,114
7	2022	215	276	1,009	1,500	416	1,085
8	2023	218	277	1,040	1,535	482	1,053
9	2024	222	279	1,071	1,572	551	1,021
10	2025	226	280	1,102	1,608	622	987
11	2026	230	282	1,133	1,645	694	951
12	2027	233	283	1,164	1,680	768	912
13	2028	237	285	1,195	1,717	845	873
14	2029	240	287	1,226	1,753	923	831
15	2030	244	288	1,257	1,789	1,002	787
16	2031	247	290	1,288	1,825	1,084	741
17	2032	251	291	1,319	1,861	1,168	693
18	2033	254	292	1,350	1,896	1,253	643
19	2034	258	294	1,381	1,933	1,341	592
20	2035	261	295	1,412	1,968	1,430	538
21	2036	265	297	1,443	2,005	1,521	484
22	2037	268	298	1,474	2,040	1,614	426
23	2038	272	300	1,505	2,077	1,708	368
24	2039	275	301	1,536	2,112	1,805	307
25	2040	279	303	1,567	2,149	1,904	245
26	2041	282	305	1,598	2,185	2,004	181
27	2042	289	306	1,629	2,224	2,106	117
28	2043	293	308	1,660	2,261	2,210	50
29	2044	297	310	1,691	2,298	2,316	(19)
30	2045	300	312	1,721	2,333	2,424	(91)
31	2046	304	313	1,752	2,369	2,534	(164)
32	2047	307	315	1,783	2,405	2,645	(240)
33	2048	311	317	1,814	2,442	2,759	(316)
34	2049	314	319	1,845	2,478	2,874	(396)
35	2050	318	321	1,876	2,515	2,991	(476)

2043



11

LOCAL RECOMMENDATIONS

1. Cities, water districts and private companies will find the greatest impact by limiting lawn watering to two days a week.
2. Utilities should consider adopting the “advanced conservation” strategies detailed in their individual reports.
3. Older MUDs and cities should consider applying for SWIFT funds to address water loss due to aging infrastructure.
4. Cities should consider requiring all restaurants, bars and hotels to only serve water unless customers ask for it.
5. Water planners, county officials and utilities should continue stakeholder engagement.
6. The free flow of information is key to stay on track.
7. Allow the Goldwater Project team to help coordinate with the Texas Water Development Board.

12

STATE RECOMMENDATIONS

- 1. Help Influence municipal utility district (MUD) standards at the Texas Legislature.**
- 2. Make system flushing “as needed” rather than mandated monthly.**

13

NEXT STEPS

- **Confirming Strategies and Issuing Individual Reports of Brazoria, Fort Bend, Galveston and Harris Counties** (July 2015)
- **Issuing County Reports** (July - August 2015)
- **Issuing Regional Report** (August 2015)
- **Presenting to RHPG in November with Final Report**
- **Continuing to track and quantify** (Ongoing)
- **Working with utilities and stakeholders to remain on pace with goals** (Ongoing)

14

SPECIAL THANKS:



The Meadows Foundation

HOUSTON ENDOWMENT

A PHILANTHROPY ENDOWED BY JESSE H. AND MARY GIBBS JONES



GOLDWATER PROJECT



Region H Planning Group
Update – July 2015

Agenda Item 10

Receive update from Consultant Team regarding the schedule and milestones for the development of the 2016 Region H Regional Water Plan.

Agenda Item 10 2016 RWP Schedule

Receive update from Consultant Team regarding the schedule and milestones for the development of the 2016 Region H Regional Water Plan.



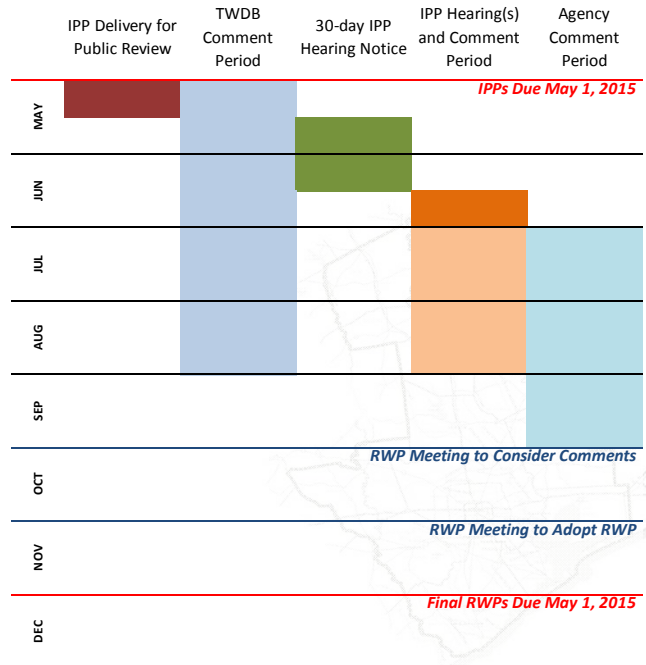
Agenda Item 10 2016 RWP Schedule

Date	Scheduled Events/Tasks
03/11/2015	RWPG Meeting: Review Chapters 5, 6, 8, 9, 10, and 11
04/01/2015	Public Hearing: Receive comments on Fifth Cycle Scope of Work.
04/08/2015	RWPG Meeting: Review / Approve Initially Prepared Plan
05/01/2015	DUE DATE: Initially Prepared Plan to TWDB
<i>PUBLIC PROCESS</i>	
07/01/2015	RWPG Meeting: Conclude public hearings on IPP
10/07/2015	RWPG Meeting: Discuss comments to IPP
11/04/2015	RWPG Meeting: Review / Approve Final Plan
12/01/2015	DUE DATE: Final Adopted Plan to TWDB

Agenda Item 10 2016 RWP Schedule

■ IPP Comment Period

- Public Hearings
 - One cancelled (Huntsville)
 - Houston and Conroe
- Comment Periods
 - Public (60 days from today)
 - TWDB (120 days from submittal)
 - Agency (90 days from today)
- Summarize Points for October RWPG Meeting



Agenda Item 10 2016 RWP Schedule

■ Other Items

- Requests for inclusion in the RWP
 - Based on Uniform Standards
 - Has the project sponsor requested (*in writing for the 2016 Plan*) that the project be included in the Regional Water Plan?
 - Worth a free five points in project prioritization.
 - Received requests from 5 sponsors.



Agenda Item 11

Receive presentation from Consultant Team regarding the submittal of electronic components of the 2016 Initially Prepared Plan to the Texas Water Development Board.

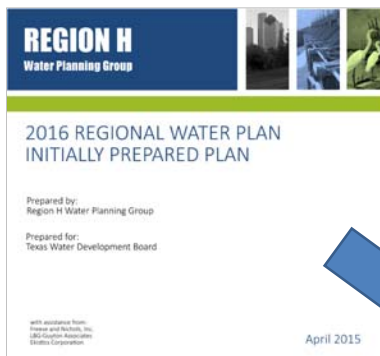
Agenda Item 11 Electronic Submittals to TWDB

Receive presentation from Consultant Team regarding the submittal of electronic components of the 2016 Initially Prepared Plan to the Texas Water Development Board.



Agenda Item 11 Electronic Submittals to TWDB

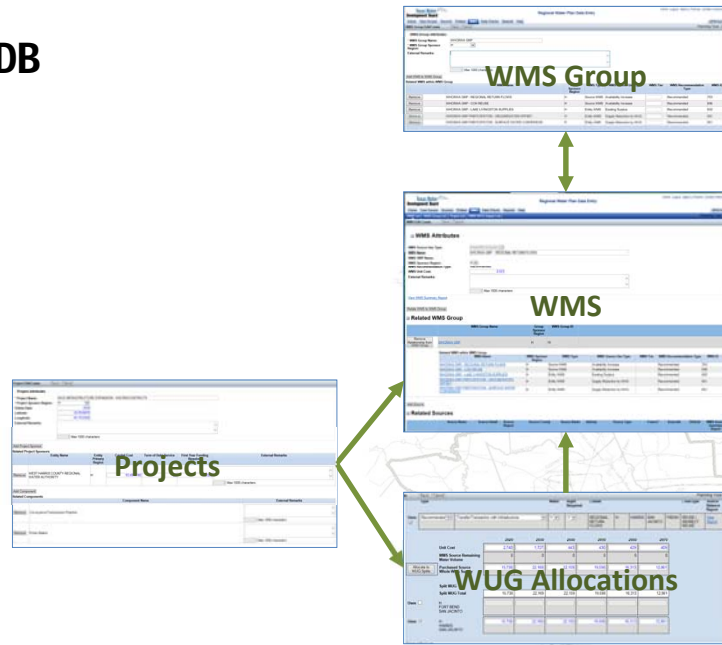
- Electronic Data for IPP
 - Database entries in DB17
 - GIS for projects
- “Due” July 1



Item ID	Item Name	Item Type	Item Status	Item Recommendation	Item Sponsor
0001	EXPANDED USE OF GROUNDWATER, LUBBOCK COUNTY	H	Source	Existing Availability	Recommended
0002	EXPANDED USE OF GROUNDWATER, JUNEAU COUNTY	H	Source	Existing Availability	Recommended
0003	ADDITIONAL SUPPLY FROM BRG	H	Source	Availability Increase	Recommended
0004	ADDITIONAL SUPPLY FROM SCOB	H	Source	Availability Increase	Recommended
0005	BRACKISH GROUNDWATER SUPPLIES	H	Source	Availability Increase	Recommended
0006	BRACKISH GROUNDWATER SUPPLIES	H	Source	Availability Increase	Recommended
0007	CHOCOMA LIFT	H	Source	Existing Supply	Recommended
0008	COCHISE LIFT, REGIONAL, BROWN COUNTY	H	Source	Availability Increase	Recommended
0009	CITY OF HOUSTON LIFT	H	Source	Existing Supply	Recommended
0010	CITY OF HOUSTON LIFT, REGIONAL, BROWN COUNTY	H	Source	Availability Increase	Recommended

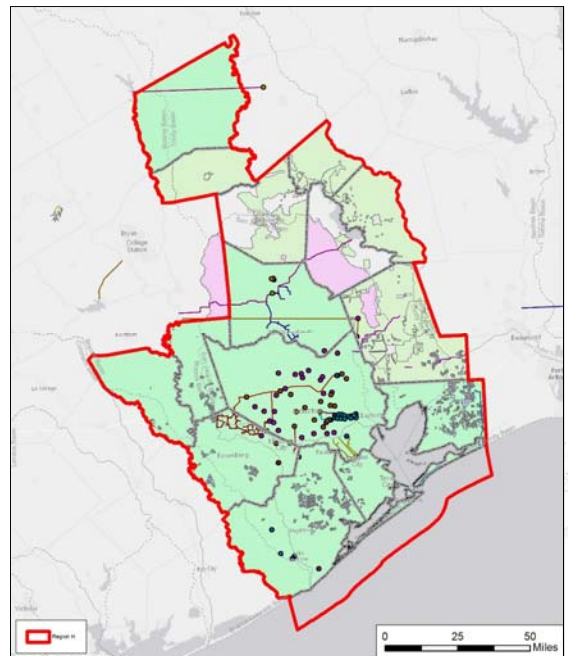
Agenda Item 11 Electronic Submittals to TWDB

- TWDB DB17
 - WMS and WMS Group
 - Name
 - Unit cost
 - Sources
 - Projects
 - Project
 - Capital cost
 - Debt terms
 - Year of implementation
 - Sponsorship
 - Components
 - ~300 hours of data entry



Agenda Item 11 Electronic Submittals to TWDB

- GIS
 - Personal geodatabase
 - Recommended and considered projects
 - Various points based on availability
 - Alignments
 - Service areas
 - Features



Agenda Item 12

Consider authorizing the San Jacinto River Authority to request statements of qualifications to prepare the 2021 Region H Regional Water Plan on behalf of the Region H Water Planning Group.

Agenda Item 12
2021 Round RFQ

Consider authorizing the San Jacinto River Authority to request statements of qualifications to prepare the 2021 Region H Regional Water Plan on behalf of the Region H Water Planning Group.



Agenda Item 12
2021 Round RFQ

“...all contractors that will be reimbursed under the fifth cycle of regional water planning grant contracts must be procured in accordance with each political subdivision’s own legal requirements.”



Agenda Item 13

Receive report regarding recent and upcoming activities related to communications and outreach efforts on behalf of the Region H Planning Group.

Agenda Item 13 Community Outreach

Receive report regarding recent and upcoming activities related to communications and outreach efforts on behalf of the Region H Planning Group.



Agenda Item 13 Community Outreach

- Harris-Galveston Subsidence District
April 17



Agenda Item 14

Agency communications and general information.

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 9, 2015

Mark Evans
Planning and Governmental Affairs Director
N. Harris Co. Regional Water Authority
3648 Cypress Creek Pkwy #110
Houston, Texas 77068

Re: Procurement and Endorsement of Services Associated with Regional Water Planning
Grant Contracts

Dear Mr. Evans:

As you complete your 2016 regional water plans and embark on the fifth cycle of regional water planning, the Texas Water Development Board (TWDB) wishes to remind both regional water planning group members and their political subdivisions that all contractors that will be reimbursed under the fifth cycle regional water planning grant contracts must be procured in accordance with each political subdivision's own legal requirements.

This is also an opportunity to inform planning group members that TWDB and its staff may not endorse any businesses, products, or services outside of the agency. In the past, TWDB employees have been asked to "recommend" outside products or services, including private companies and/or contractors with which the agency may do business. It is our agency policy that employees of the TWDB will not endorse or promote any outside products or services.

We look forward to receiving the final 2016 regional water plans and to working with you during this next planning cycle.

Sincerely,



Matt Nelson, Director
Water Use, Projections, & Planning Division

cc: Mr. Jace Houston, San Jacinto River Authority, P.O. Box 329, Conroe, Texas 77305
RWPG Members
RWPG Technical Consultants

Our Mission : **Board Members**

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

: Carlos Rubinstein, Chairman | Bech Bruun, Member | Kathleen Jackson, Member
: Kevin Patteson, Executive Administrator

