

# **REGION H**

## **Water Planning Group**

### **MEETING MATERIALS**

**April 4, 2018**

**San Jacinto River Authority**



## Common Region H Terms and Conversion Factors

### List of Abbreviations

COA	Certificate of Adjudication
CRU	Collective Reporting Unit
DCP	Drought Contingency Plan
DFC	Desired Future Condition
DOR	Drought of Record
EA	Executive Administrator
EPA	Environmental Protection Agency
FWSD	Fresh Water Supply District
GAM	Groundwater Availability Model
GCD	Groundwater Conservation District
GMA	Groundwater Management Area
GRP	Groundwater Reduction Plan
IPP	Initially Prepared Plan
MAG	Modeled Available Groundwater
MUD	Municipal Utility District
MWP	Major Water Provider
PDSI	Palmer Drought Severity Index
PWS	Public Water Supply
RHWPG	Region H Water Planning Group
ROR	Run-of-River
RWP	Regional Water Plan
RWPA	Regional Water Planning Area
RWPG	Regional Water Planning Group
SWIFT	State Water Implementation Fund for Texas
SWP	State Water Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
TWC	Texas Water Code
TWDB	Texas Water Development Board
WAM	Water Availability Model
WCID	Water Control and Improvement District
WCP	Water Conservation Plan
WMS	Water Management Strategy
WRAP	Water Rights Analysis Package
WUD	Water Utility Database
WUG	Water User Group
WWP	Wholesale Water Provider

### Water Measurements

1 acre-foot (AF) = 43,560 cubic feet = 325,851 gallons

1 acre-foot per year (ac-ft/yr) = 325,851 gallons per year = 893 gallons per day

1 gallon per minute (gpm) = 1,440 gallons per day = 1.6 ac-ft/yr

1 million gallons per day (mgd) = 1,000,000 gallons per day = 1120 ac-ft/yr



**Region H Water Planning Group**  
**10:00 AM Wednesday**  
**April 4, 2018**  
**San Jacinto River Authority Office**  
**1577 Dam Site Rd, Conroe, Texas 77304**

**AGENDA**

1. Introductions.
2. Review and approve minutes of December 6, 2017 meeting.
3. **Receive public comments on specific issues related to agenda items 4 through 14.** (Public comments limited to 3 minutes per speaker)
4. Receive Nominating Committee report and elect officers and members of the Executive Committee of the Region H WPG and consider taking action to approve members to fill vacancies on the Region H WPG.
5. Receive update from Consultant Team regarding the schedule and milestones for the development of the 2021 Region H RWP.
6. Receive update from Consultant Team and Surface Water Supply Committee regarding draft surface water supply availability estimates and consider taking action to authorize the Consultant Team to develop and submit to the Texas Water Development Board (TWDB) a request for potential exceptions to surface water modeling requirements.
7. Receive update from Consultant Team and Surface Water Supply Committee regarding draft reuse supply availability estimates.
8. Receive update from Consultant Team and Groundwater Supply Committee regarding groundwater supply availability estimates and consider taking action to approve supply estimates.
9. Receive report from Consultant Team and Groundwater Supply Committee regarding MAG Peak Factors and consider taking action to authorize Consultant Team to coordinate with groundwater regulatory entities to develop peak factors for Region H and submit an associated request to TWDB.
10. Receive report from Consultant Team and Water Management Strategy (WMS) Committee regarding WMS analyses and consider taking action to approve the notice-to-proceed request and authorizing the Consultant Team and San Jacinto River Authority to submit the request to TWDB, coordinate with TWDB as needed on follow-up information, and execute the subsequent contract amendment issued.
11. Consider and take action to authorize the San Jacinto River Authority to execute a contract amendment with TWDB for additional funding.
12. Receive report from Consultant Team and WMS Committee regarding WMS allocation safety factors and consider taking action to designate a safety factor for use in development of the 2021 Region H Regional Water Plan.
13. Receive report regarding recent and upcoming activities related to communications and outreach efforts on behalf of the Region H Water Planning Group.

14. Agency communications and general information.
15. **Receive public comments.** (Public comments limited to 3 minutes per speaker)
16. Next Meeting: TBD.
17. Adjourn

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

## Agenda Item 2

Review and approve minutes of December 6, 2017 meeting.





**REGION H WATER PLANNING GROUP  
MINUTES OF REGULAR MEETING  
DECEMBER 6, 2017**

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A regular meeting of the Region H Water Planning Group was held at 10:00 a.m., December 6, 2017, at the San Jacinto River Authority General and Administration Building, a notice of said meeting was posted as required by law.

**MEMBERS PRESENT:** David Bailey, John Bartos, Robert Bruner, David Collinsworth, James Comin, Mark Evans, Yvonne Forrest, Art Henson, Jace Houston, Robert Istre, Kathy Jones, Ivan Langford, Glenn Lord, Marvin Marcell, Carl Masterson, Michael Turco, and Pudge Willcox.

**DESIGNATED ALTERNATES:** Jun Chang for Jimmie Schindewolf, Alisa Max for John Blount, Tom Michel for Bill Teer, and Mike O'Connell for Bob Hebert.

**MEMBERS ABSENT:** James Morrison, Ruth Stultz, and Kevin Ward (Bill Holder represented Mr. Ward but not present as alternate).

**NON-VOTING MEMBERS PRESENT:** Scott Hall and Lann Bookout

The meeting was called to order at 10:02 a.m.

**1. INTRODUCTIONS**

There were no introductions.

**2. REVIEW AND APPROVE MINUTES OF NOVEMBER 1, 2017 MEETING**

Mr. Bartos made a motion to approve the minutes of the November 1, 2017, Region H Water Planning Group meeting. The motion was seconded by Mr. Langford and carried unanimously.

**3. RECEIVE PUBLIC COMMENTS ON SPECIFIC ISSUES RELATED TO AGENDA ITEMS 4 THROUGH 12**

There were no public comments.

**4. RECEIVE PRESENTATION FROM CONSULTANT TEAM REGARDING THE PROPOSED APPLICATION BY THE CITY OF MANVEL TO AMEND THE 2016 REGION H REGIONAL WATER PLAN (RWP) AND CONSIDER APPROVING THE SUBMITTAL OF THE APPLICATION PACKAGE TO TWDB FOR THE DETERMINATION OF MINOR AMENDMENT STATUS.**

Mr. Jordan Furnans with LRE Water, LLC, provided information on behalf of City of Manvel, Texas (“the city”). He explained that the city is looking for potential surface water supplies and is requesting to obtain water rights for Mustang Bayou for 5,237 acre-ft/year. Mr. Afinowicz explained that the process for this request is a formality because it is considered a new appropriation or supply. He stated that the first step is to submit the proposed amendment materials to TWDB for determination of minor or major amendment status. Mr. Bookout explained the processes for the determination of a minor or major amendment. Discussion ensued related to environmental impacts, environmental flows, and in general, the process by which the city is requesting this amendment. Mr. Masterson called the question and was seconded. Mr. Lord made a motion to approve the submittal of the application package from the City of Manvel to the TWDB for the determination of minor amendment status. The motion was seconded by Mr. Houston. After further discussion, the motion carried with eighteen ayes, two nays (Mr. Langford and Mr. O’Connell), and two abstentions (Mr. Masterson and Mr. Collinsworth).

**5. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING THE SCHEDULE AND MILESTONES FOR THE DEVELOPMENT OF THE 2021 REGION H RWP.**

Mr. Taucer provided an update regarding the schedule and development of the 2021 Region H RWP. He stated the study is on schedule and on track. In addition, Mr. Taucer stated that the stakeholder coordination continues as it relates to wholesale and major water providers.

**6. RECEIVE UPDATE FROM CONSULTANT TEAM AND WATER MANAGEMENT STRATEGY COMMITTEE REGARDING A PROCESS FOR IDENTIFYING AND EVALUATING POTENTIALLY FEASIBLE WATER MANAGEMENT STRATEGIES AND CONSIDER TAKING ACTION TO APPROVE THE PROCESS FOR USE IN THE 2021 REGION H RWP.**

Mr. Taucer stated that pursuant to TAC 357.12(b), the Region H Water Planning Group (RHWPG) is required to document its process for identifying and selecting Water Management Strategies (WMS) for development of the 2021 Regional Water Plan (RWP). He stated that this process shall be presented to the public for comment at a public meeting. Further, he explained the primary goal of the WMS selection methodology is to pair WMS with a need of a particular water user group (WUG). Mr. Taucer explained that potential WMS will be defined based on a determination of needs developed from a comparison of projected demand and existing supplies. He stated that the strategies will be analyzed by the Major Water Provider (MWP) or WUGs. Mr. Taucer then provided details related to the shortage analysis, application of general WMS, identification of potential WMS to add new water supplies, and the WMS selection process. Mr. Chang made a motion to approve the process to identify and evaluate potentially feasible water management strategies to use in the 2021 Region H Regional Water Plan. The motion was seconded by Mr. Collinsworth and carried unanimously.

**7. RECEIVE UPDATE FROM CONSULTANT TEAM AND NON-POPULATION DEMANDS COMMITTEE REGARDING RECOMMENDED REVISIONS TO DRAFT TWDB PROJECTIONS FOR THE 2021 REGION H RWP AND CONSIDER APPROVING SUBMITTAL TO TWDB.**

Mr. Taucer provided information relative to the Non-Population Demands Committee's ("NPDC") analysis and recommendations for each category. He stated that the RHWPG developed draft projections that were considered by the NPWDC based on input from the committee and local data provided by several industries and wholesale water providers, the RHWPG developed proposed demand revisions. He went on to detail how the proposed demand revisions were developed. Mr. Chang made a motion to approve the recommended revisions to the draft Texas Water Development Board (TWDB) projections for the 2021 Region H RWP and approve submittal of same to the TWDB. The motion was seconded by Ms. Forrest and carried unanimously.

**8. RECEIVE UPDATE FROM CONSULTANT TEAM AND POPULATIONS DEMANDS COMMITTEE REGARDING RECOMMENDED REVISIONS TO DRAFT TWDB PROJECTIONS FOR THE 2021 REGION H RWP AND CONSIDER APPROVING SUBMITTAL TO TWDB.**

Mr. Taucer provided information relative to the Populations Demands Committee's ("PDC") analysis and recommendations for each category. He explained that the TWDB developed projections of population and municipal water demand at the WUG level for the 2021 RWPs. Further, the projections were based on the projected population and demand in the 2017 State Water Plan and were adjusted to align with utility boundaries based on TWDB Water Use Survey data. He stated that based on the Fifty Amended General Guidelines for Fifth Cycle of the Regional Water Plan Development, RWPGs may request revisions to these draft projections. He explained that in July, 2017, the RHWPG issued a survey to the 342 WUGs in the region, in which WUGs were asked to review the draft population and demand projections for their entity. He stated that based on the survey results, the RHWPG identified 16 named municipal WUGs for which it recommends revisions to draft projections. He explained and detailed how the RHWPG developed the proposed revisions to population and municipal demand projections. Mr. Masterson made a motion to approve the Populations Demands Committee's revisions to the TWDB draft projections for the 2021 Region H RWP and approve submittal of same to TWDB. The motion was seconded by Mr. Houston and carried unanimously.

**9. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING EVALUATION OF EXISTING WATER SUPPLIES AND UPCOMING SUPPLY COMMITTEE ACTIVITIES.**

Mr. Afinowicz provided an update relative to the evaluation of existing water supplies as related to surface water, groundwater, reuse, contractual transfer, and data management. He provided the status and activities for each category.

**10. DISCUSS MEETING SITES AND CONSIDER TAKING ACTION TO DESIGNATE A LIST OF APPROVED SITES FOR REGIONAL WATER PLANNING GROUP AND COMMITTEE MEETINGS.**

Mr. Evans discussed the possibility of designating specific locations for future Region H WPG and committee meetings. Mr. Houston stated that he researched the subject and did not find any statutory requirements related to the designation of meeting locations.

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

Mr. Taucer stated that he would be happy to present information related to the water planning process to any interested persons or organizations.

**12. AGENCY COMMUNICATIONS AND GENERAL INFORMATION**

Mr. Bookout reported on the proposed rulemaking process that will be presented to the TWDB on December 7, 2017. Mr. Evans reminded the RHWPG that there is a vacancy representing electric generating utilities and a vacancy representing small business, which will be addressed during the next RHWPG meeting.

**13. RECEIVE PUBLIC COMMENTS**

Ms. Savory spoke in regards to the USGS's MODFLOW 6.

**14. NEXT MEETING: TBD**

Mr. Evans announced that the next meeting will be determined at a later date.

**15. ADJOURN**

Without objection, the meeting was adjourned at 12:04 p.m.

## Agenda Item 4

Receive Nominating Committee report and elect officers and members of the Executive Committee of the Region H WPG and consider taking action to approve members to fill vacancies on the Region H WPG.



## **Agenda Item 4 Membership**

### **Action:**

Elect officers and members of the Executive Committee of the Region H WPG.



## **Agenda Item 4 Membership**

### **Action:**

Approve members to fill vacancies on the Region H WPG.



**NOTICE OF VACANCY FOR  
REGION H WATER PLANNING GROUP  
MEMBER REPRESENTING SMALL BUSINESS**

The Region H Water Planning Group (WPG) is hereby giving notice of a vacancy on the Region H Water Planning Group for a voting member representing small business. The Region H WPG may consider making an appointment to fill this vacancy on or after December 6, 2017. The term of this appointment ends in 2018.

**Background:**

The Region H WPG was established by appointment of an initial coordinating body by the TWDB on February 19, 1998, and one subsequent additional appointment by the initial coordinating body. The purpose of the Region H WPG shall be to provide comprehensive regional water planning and to carry out the related responsibilities placed on regional water planning groups by state law, including Texas Water Code Chapter 16 and TWDB rules, including 31 TAC Chapters 355, 357, and 358, in and for the Region H Water Planning Area (WPA).

**Responsibilities:**

The Region H WPG shall have the responsibility for performing the functions defined in Texas Water Code, Chapter 16 and in 31 TAC Chapters 355, 357, and 358 related to regional water planning groups for the Region H WPA. Foremost among those responsibilities shall be the development of a regional water plan for the Region H WPA that identifies both short and long-term water supply needs and recommends water management strategies for addressing them.

**Conditions of Membership:**

In order to be eligible for voting membership on the Region H WPG, a person must represent the interest for which a member is sought, be willing to participate in the regional water planning process, and abide by the bylaws.

Any small business within the Region H area interested in nominating a representative to serve as a voting member representing small business may submit a letter of interest or recommendation to:

Mark Evans, Chair Region H WPG  
c/o San Jacinto River Authority  
P.O. Box 329  
Conroe, Texas 77305



**NOTICE OF VACANCY FOR  
REGION H WATER PLANNING GROUP  
MEMBER REPRESENTING ELECTRIC GENERATING UTILITIES**

The Region H Water Planning Group (WPG) is hereby giving notice of a vacancy on the Region H Water Planning Group as a result of a resignation of a voting member representing electric generating utilities. The Region H WPG may consider making an appointment to fill this vacancy on or after December 6, 2017. The term of this appointment ends in 2018.

**Background:**

The Region H WPG was established by appointment of an initial coordinating body by the TWDB on February 19, 1998, and one subsequent additional appointment by the initial coordinating body. The purpose of the Region H WPG shall be to provide comprehensive regional water planning and to carry out the related responsibilities placed on regional water planning groups by state law, including Texas Water Code Chapter 16 and TWDB rules, including 31 TAC Chapters 355, 357, and 358, in and for the Region H Water Planning Area (WPA).

**Responsibilities:**

The Region H WPG shall have the responsibility for performing the functions defined in Texas Water Code, Chapter 16 and in 31 TAC Chapters 355, 357, and 358 related to regional water planning groups for the Region H WPA. Foremost among those responsibilities shall be the development of a regional water plan for the Region H WPA that identifies both short and long-term water supply needs and recommends water management strategies for addressing them.

**Conditions of Membership:**

In order to be eligible for voting membership on the Region H WPG, a person must represent the interest for which a member is sought, be willing to participate in the regional water planning process, and abide by the bylaws.

Any electric generating utility within the Region H area interested in nominating a representative to serve as a voting member representing electric generating utilities may submit a letter of interest or recommendation to:

Mark Evans, Chair Region H WPG  
c/o San Jacinto River Authority  
P.O. Box 329  
Conroe, Texas 77305

**NOTICE OF VACANCY FOR  
REGION H WATER PLANNING GROUP  
MEMBER REPRESENTING RIVER AUTHORITIES**

The Region H Water Planning Group (WPG) is hereby giving notice of a vacancy on the Region H Water Planning Group for a voting member representing river authorities. The Region H WPG may consider making an appointment to fill this vacancy on or after April 4, 2018. The term of this appointment ends in 2018.

**Background:**

The Region H WPG was established by appointment of an initial coordinating body by the TWDB on February 19, 1998, and one subsequent additional appointment by the initial coordinating body. The purpose of the Region H WPG shall be to provide comprehensive regional water planning and to carry out the related responsibilities placed on regional water planning groups by state law, including Texas Water Code Chapter 16 and TWDB rules, including 31 TAC Chapters 355, 357, and 358, in and for the Region H Water Planning Area (WPA).

**Responsibilities:**

The Region H WPG shall have the responsibility for performing the functions defined in Texas Water Code, Chapter 16 and in 31 TAC Chapters 355, 357, and 358 related to regional water planning groups for the Region H WPA. Foremost among those responsibilities shall be the development of a regional water plan for the Region H WPA that identifies both short and long-term water supply needs and recommends water management strategies for addressing them.

**Conditions of Membership:**

In order to be eligible for voting membership on the Region H WPG, a person must represent the interest for which a member is sought, be willing to participate in the regional water planning process, and abide by the bylaws.

Any river authority within the Region H area interested in nominating a representative to serve as a voting member representing river authorities may submit a letter of interest or recommendation to:

Mark Evans, Chair Region H WPG  
c/o San Jacinto River Authority  
P.O. Box 329  
Conroe, Texas 77305



## Brazos River Authority

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February 14, 2018

The Honorable Mark Evans  
Chair  
Region H Water Planning Group  
c/o San Jacinto River Authority  
P.O. Box 329  
Conroe, Texas 77305

Dear Judge Evans:

On April 1, 2018, I will assume the responsibilities of General Manager/Chief Executive Officer for the Brazos River Authority (BRA). In accordance with the Texas Administrative Code, the Region G Water Planning Group (Brazos G) selected the BRA as its political subdivision and administrative office. Brazos G bylaws require the BRA's General Manager to serve as Secretary/Treasurer and member of the Executive Committee.

I respectfully submit my resignation as voting member for the Region H Water Planning Group to fulfill the duties of my new position. I would appreciate consideration by the Nominating Committee for Mr. Brad Brunett to fill the vacant position. Mr. Brunett serves as the BRA's Water Services Manager and is an expert on the water challenges facing Texas. He has also served as my alternate for the past four years. He is an excellent candidate to represent the interests of river authorities for Region H.

It has been my distinct pleasure serving the citizens of Region H and will continue to do so as General Manager of the BRA. I commend you and the other Region H members for your continued dedication and hard work to ensure water resources for the State of Texas.

Sincerely,

DAVID COLLINSWORTH  
Regional Manager, Central and Lower Basins

DC:kld

cc: Mr. Jace Houston, San Jacinto River Authority

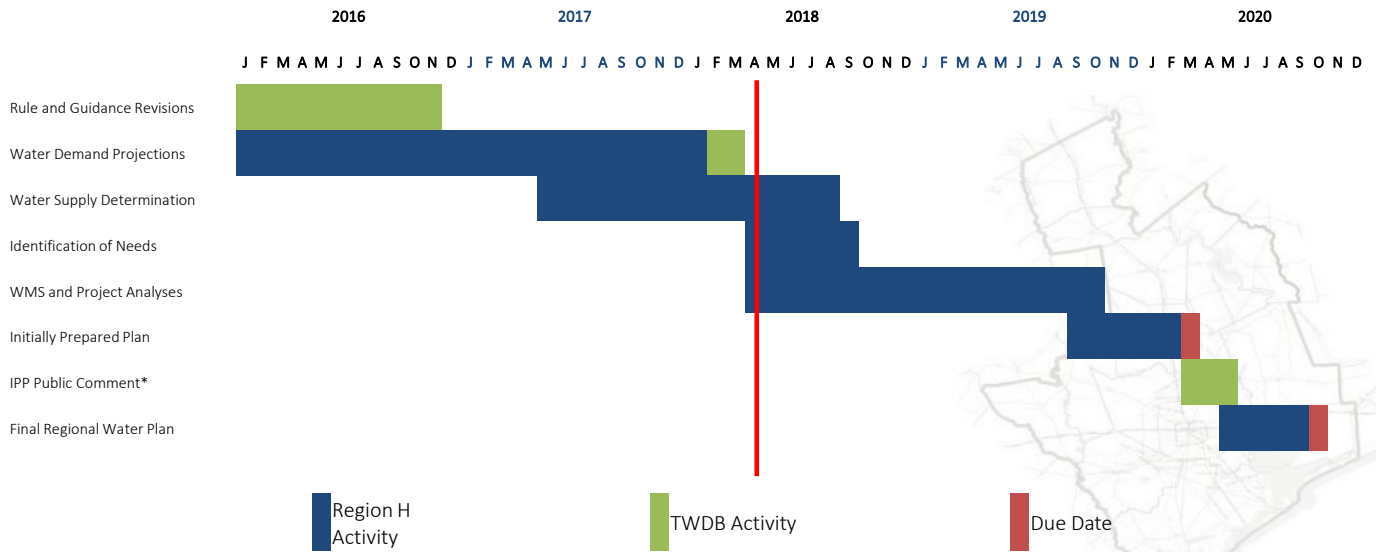


## Agenda Item 5

Receive update from Consultant Team regarding the schedule and milestones for the development of the 2021 Region H RWP.



# Agenda Item 5 2021 RWP Schedule



\*Region H accepts public comment throughout the planning cycle and at each RWPG and committee meeting.

# Agenda Item 5 2021 RWP Schedule

Date	Scheduled Events/Tasks
04/2018	RWPG Meeting
09/2018	DUE DATE: Technical Memorandum
03/2020	DUE DATE: Initially Prepared Plan
10/2020	DUE DATE: FINAL RWP

## Agenda Item 5 2021 RWP Schedule



- Availability analyses
- Stakeholder coordination
- Existing supply allocation
- WMS focus areas and scoping



## Agenda Item 5 2021 RWP Schedule

<http://www.regionhwater.org/about/CommitteeAssignments.html>





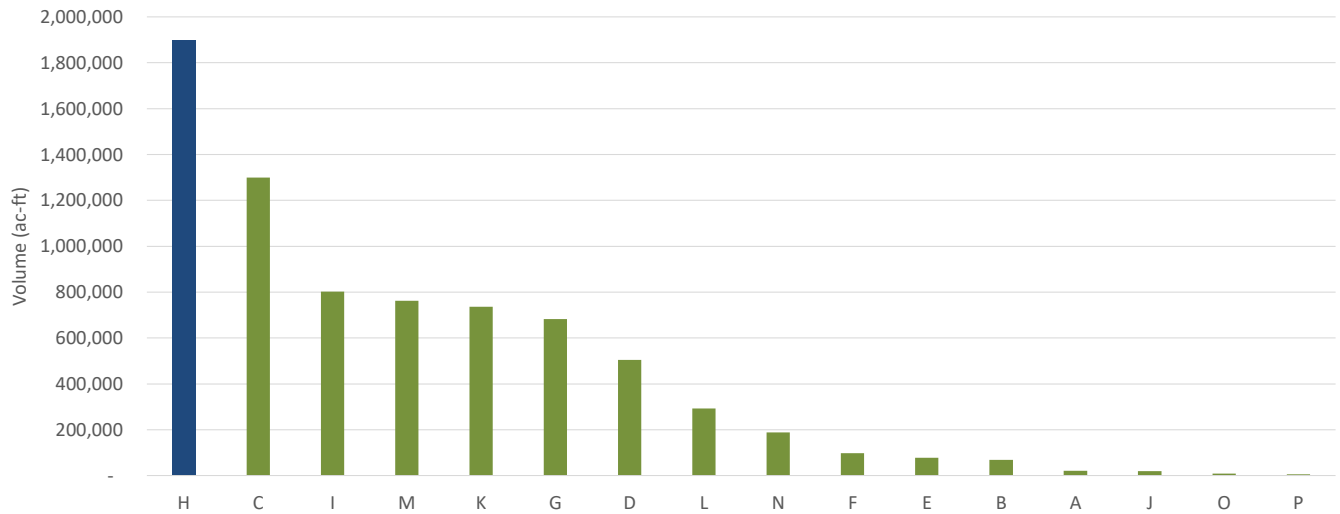
## Agenda Item 6

Receive update from Consultant Team and Surface Water Supply Committee regarding draft surface water supply availability estimates and consider taking action to authorize the Consultant Team to develop and submit to the Texas Water Development Board (TWDB) a request for potential exceptions to surface water modeling requirements.

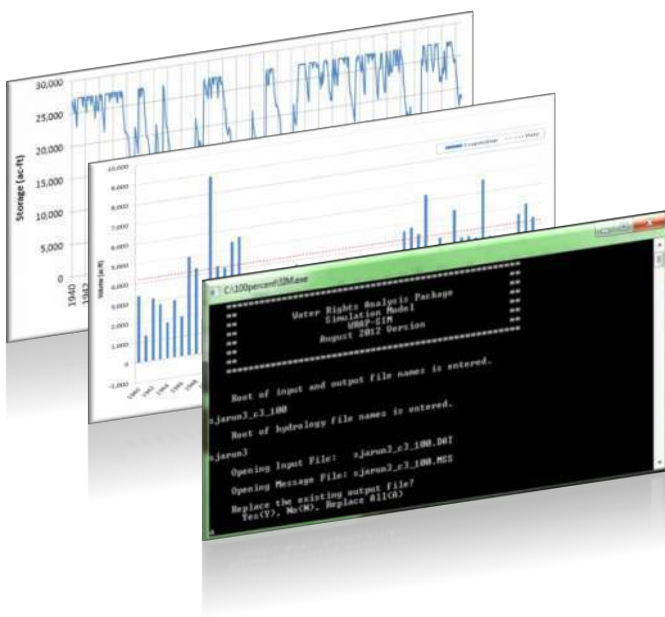


## Agenda Item 6 Surface Water Availability

2016 RWP Existing WUG Surface Water Supply



## Agenda Item 6 Surface Water Availability



- TCEQ Water Availability Model (WAM) Run 3
- Existing permanent water rights and flow requirements
- Priority order
- Historical hydrology
- Full authorized diversions
- No return flows (usually)
- Original storage

## Agenda Item 6 Surface Water Availability

### Reservoir

- Firm yield
- Sedimentation
  - Reservoir >5,000 ac-ft
  - No variance required
- Evaluate individually
- Listed by reservoir or system



## Agenda Item 6 Surface Water Availability

### Run-of-River

- Minimum annual diversion
- Sedimentation optional
  - Region H excludes
  - Conservative assumption
- Evaluate in bulk
- Listed by county and basin



## Agenda Item 6 Surface Water Availability

### Municipal Sole Source

- Minimum monthly diversion
- Evaluate individually
- Aggregated with other run-of-river



## Agenda Item 6 Surface Water Availability

### Local Supplies

- Firm yield
- Non-permit supply
  - Agriculture
  - Mining
- Evaluate individually
- Aggregated by county and basin
- Region H excludes – not enough data



## Agenda Item 6 Surface Water Availability

- Brazos-Colorado (ROR)
  - Industrial
  - ConocoPhillips and Hilcorp

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)
Brazos – Colorado ROR	Brazoria	3,322	3,211
<b>TOTAL</b>		<b>3,322</b>	<b>3,211</b>



## Agenda Item 6 Surface Water Availability

- Brazos (ROR)
  - Range of use
  - Dow, GCWA, NRG, etc.
  - Included addl. conservative assumptions for 2016 RWP

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)*
Brazos ROR	Brazoria	TBD	167,759
Brazos ROR	Fort Bend	TBD	296,430
Brazos ROR	Waller	TBD	61
<b>TOTAL</b>		<b>TBD</b>	<b>464,250</b>

\*Modeled Year 2020 values. RWP excluded some supplies by rightholder request.



## Agenda Item 6 Surface Water Availability

- San Jacinto – Brazos
  - Range of use
  - GCWA, COSL
  - Irrigation rights

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)
San Jacinto-Brazos ROR	Brazoria	TBD	32,599
San Jacinto-Brazos ROR	Fort Bend	TBD	5,803
San Jacinto-Brazos ROR	Galveston	TBD	36
San Jacinto-Brazos ROR	Harris	TBD	388
<b>TOTAL</b>		<b>TBD</b>	<b>38,826</b>



## Agenda Item 6 Surface Water Availability

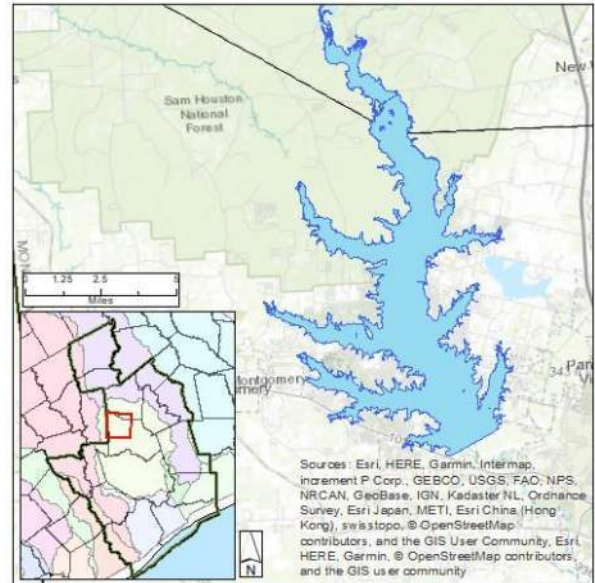
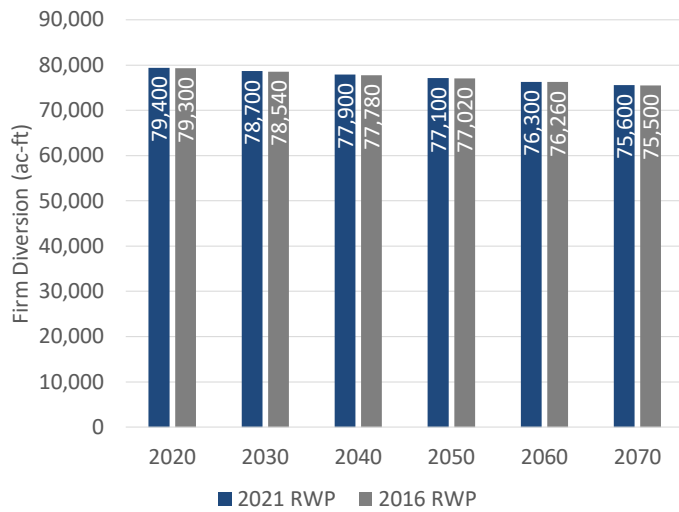
- San Jacinto (ROR)
  - Range of use
  - COH and SJRA
  - Small irrigation rights

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)
San Jacinto ROR	Harris	12,477	12,511
San Jacinto ROR	Liberty	9	0
San Jacinto ROR	Montgomery	141	141
<b>TOTAL</b>		<b>12,627</b>	<b>12,652</b>



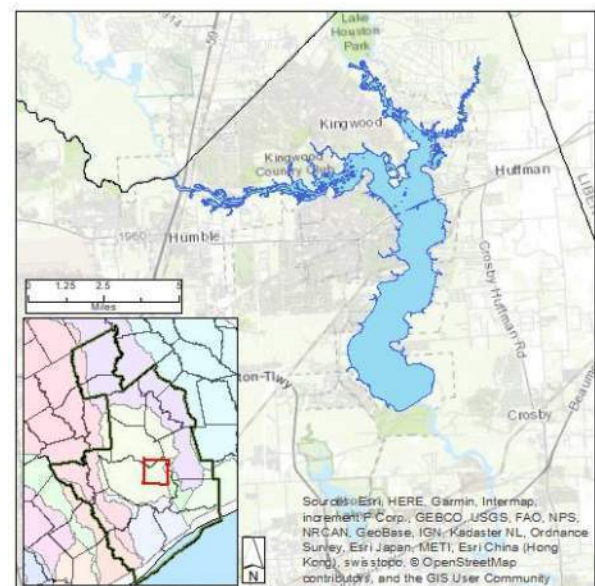
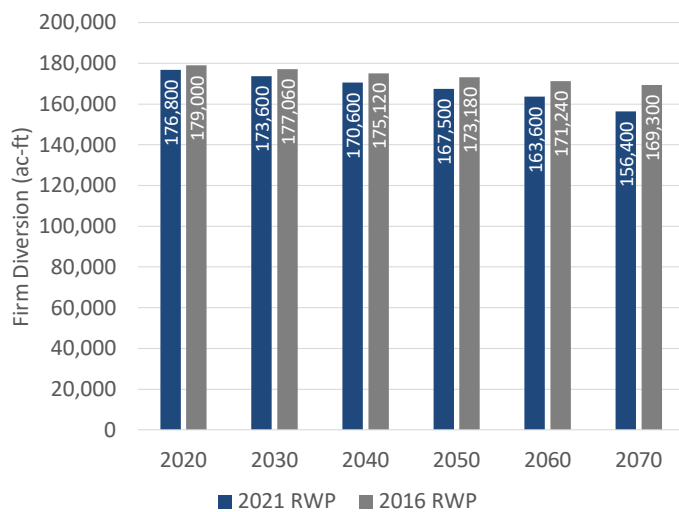
# Agenda Item 6 Surface Water Availability

## ■ Lake Conroe



# Agenda Item 6 Surface Water Availability

## ■ Lake Houston



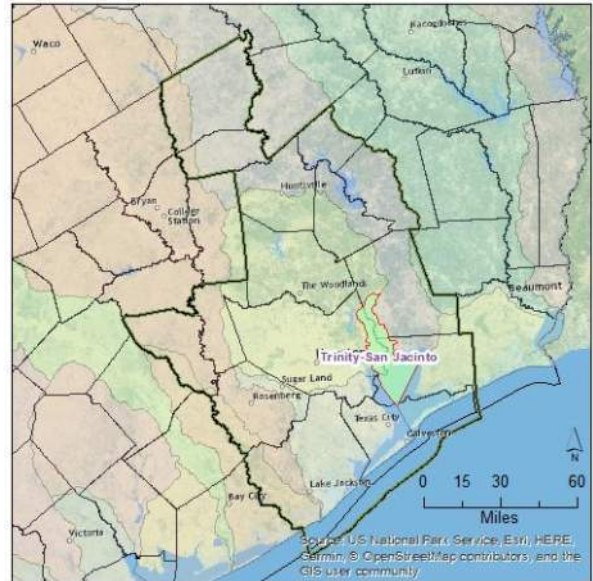


## Agenda Item 6 Surface Water Availability

- Trinity – San Jacinto
  - Region H is ROR only
  - Predominantly irrigation
  - Multi-county

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)*
Trinity-San Jacinto ROR	Chambers	1,213	1,213
Trinity-San Jacinto ROR	Harris	2,420	2,198
Trinity-San Jacinto ROR	Liberty	1,904	1,905
<b>TOTAL</b>		<b>5,537</b>	<b>5,316</b>

\*Excludes 30,000 ac-ft of saline supply.



## Agenda Item 6 Surface Water Availability

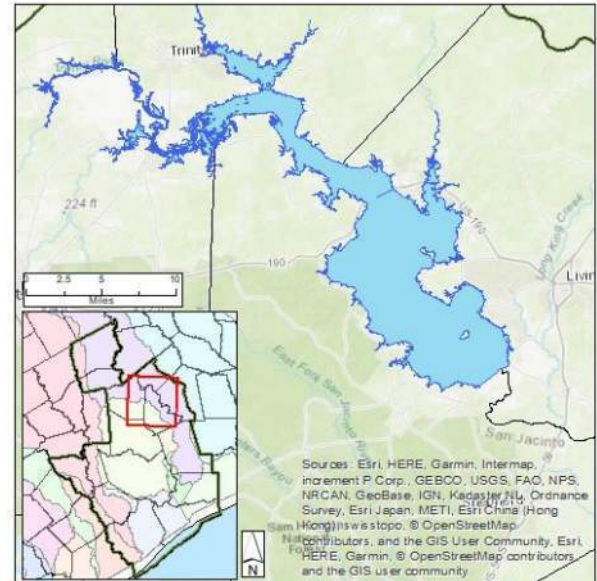
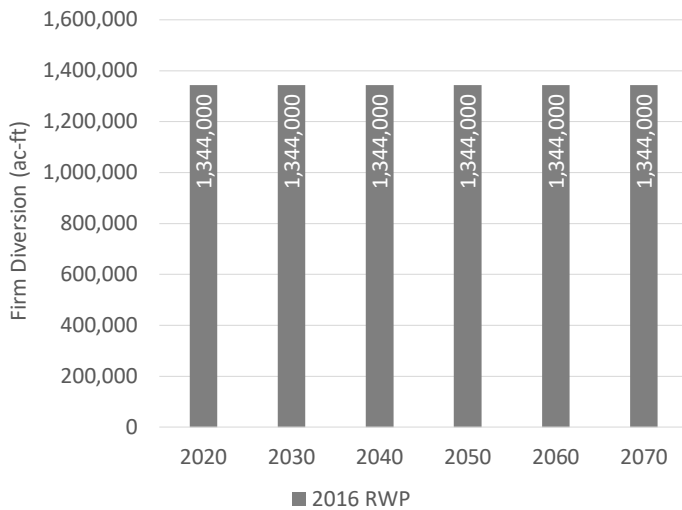
- Trinity (ROR)
  - Six counties
  - Range of use
  - CLCND, COH, SJRA, LNVA, and small rights

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)
Trinity ROR	Chambers	TBD	60,835
Trinity ROR	Leon	TBD	156
Trinity ROR	Liberty	TBD	51,077
Trinity ROR	Madison	TBD	169
Trinity ROR	Polk	TBD	26,510
Trinity ROR	Walker	TBD	439
<b>TOTAL</b>		<b>TBD</b>	<b>139,186</b>



## Agenda Item 6 Surface Water Availability

### ■ Lake Livingston



## Agenda Item 6 Surface Water Availability

### ■ Neches-Trinity

- Predominantly irrigation
- Chambers County

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)
Neches-Trinity ROR	Chambers	37,481	37,700
<b>TOTAL</b>		<b>37,481</b>	<b>37,700</b>



## Agenda Item 6 Surface Water Availability

- Neches
  - Irrigation
  - Liberty County

Source	County	Draft Est. (ac-ft)	2016 RWP (ac-ft)
Neches ROR	Liberty	176	N/A
<b>TOTAL</b>		<b>176</b>	<b>N/A</b>



## Agenda Item 6 Surface Water Availability

- Formal request for any change beyond major reservoir sedimentation
  - Description
  - Justification
  - Availability impacts
  - Date approved by RWPG
- Document in RWP Chapter 3
- Unmodified results documented



## **Agenda Item 6**

### **Surface Water Availability**

#### **Brazos-Colorado Coastal Basin**

- Issues identified during review
- Omitted rights, swapped priority or volume
  - Region K rights
  - No impact to H volume
  - Limited data
  - Leave as modeled
- Legacy reservoir code



## **Agenda Item 6**

### **Surface Water Availability**

#### **Brazos River Basin / San Jacinto-Brazos Coastal Basin**

- Region H utilizes modified WAM from Region G.
  - Contractual relationships
  - Changes in recent years
- Model in progress – est. late April
  - System operation
  - Limited return flow
  - Diversion locations
  - Subordination agreements
  - Other adjustments



## **Agenda Item 6**

### **Surface Water Availability**

#### **San Jacinto River Basin**

- Potential operational changes
- Reservoir-focused analysis
- Evaluation in progress



## **Agenda Item 6**

### **Surface Water Availability**

#### **Trinity River Basin**

- Coordination with Region C
- Upstream return flows
  - Lake Livingston permit
  - Not used for ROR rights
- Diversion locations
- NTMWD amendments
- Evaluation in progress



## Agenda Item 6 Surface Water Availability

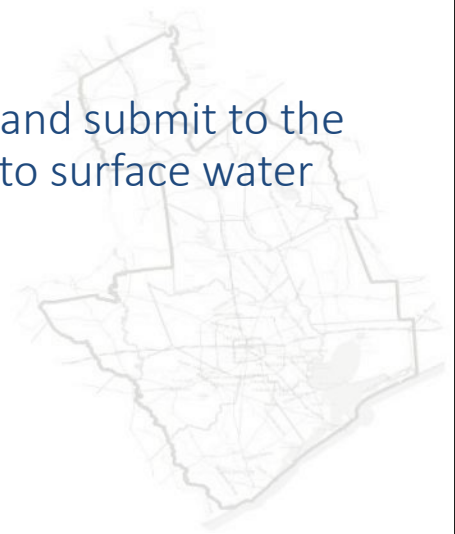
- Thoughts on basin list?
- Other basins?



## Agenda Item 6 Surface Water Availability

### **Action:**

Authorize the Consultant Team to develop and submit to the TWDB a request for potential exceptions to surface water modeling requirements.



## Agenda Item 7

Receive update from Consultant Team and Surface Water Supply Committee regarding draft reuse supply availability estimates.





## Agenda Item 7 Reuse Availability



- Direct and indirect
- Distinct challenges
  - Generally not modeled
  - Not all reuse applicable
  - Challenge to find “firm” amount
- TWDB guidance on limits
  - Expected returns based on demand
  - Permit
  - Infrastructure

## Agenda Item 7 Reuse Availability

- Interesting source to evaluate
  - Limited data
  - Challenge to ID “firm”
- Cautious approach in last RWP
  - 10-year max with recent use
- Building on method for 2021 RWP
  - Default to constant value
  - Coordinate with WUGs on capacity
  - New reuse
  - Avoid over/under represent WMS



## Agenda Item 7 Reuse Availability

Reuse Supplies in Region H RWP



## Agenda Item 7 Reuse Availability

### ■ New reuse sources

- Clear Lake City Water Authority
- Corinthian Point MUD 2
- Forest Hills MUD
- Fort Bend WCID 2
- Galveston County WCID 1
- Galveston County WCID 8
- Harris County MUD 119
- Meadows Place
- Montgomery County MUD 8
- NHCRWA
- Quail Valley
- Richmond
- WHCRWA
- Additional Manufacturing
- Additional Mining
- Expect more with continued coordination



## Agenda Item 8

Receive update from Consultant Team and Groundwater Supply Committee regarding groundwater supply availability estimates and consider taking action to approve supply estimates.



## Agenda Item 8 Groundwater Availability

### GMA 11

County	Aquifer	Modeled Available Groundwater (ac-ft/yr)						% Change from 2016 RWP (2020 MAG)
		2020	2030	2040	2050	2060	2070	
Trinity	Carrizo-Wilcox	99	99	99	99	99	99	-91%
Trinity	Sparta	29	29	29	29	29	29	-90%

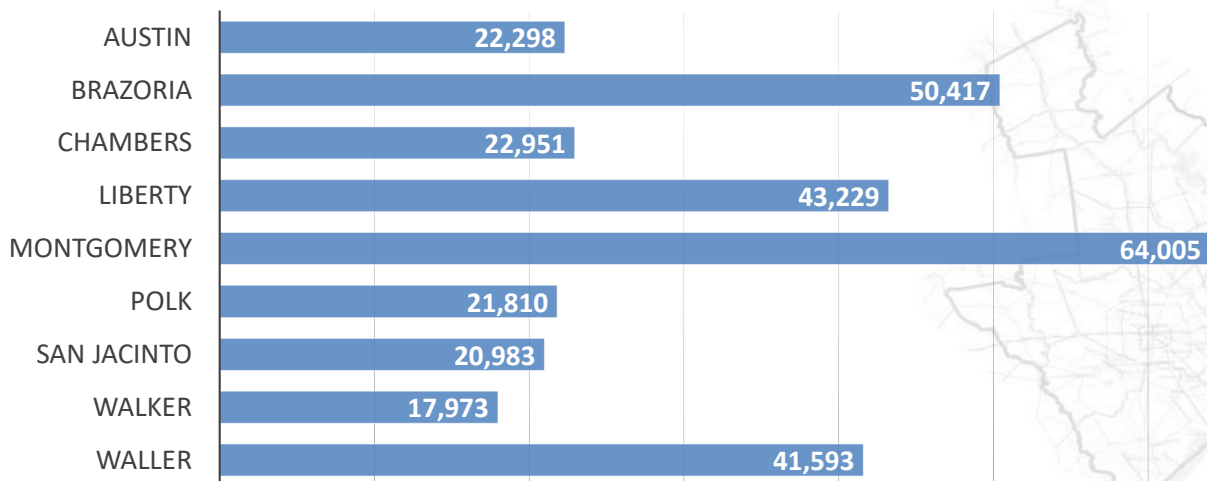
### GMA 12

County	Aquifer	Modeled Available Groundwater (ac-ft/yr)						% Change from 2016 RWP (2020 MAG)
		2020	2030	2040	2050	2060	2070*	
Leon	Carrizo-Wilcox	14,288	14,461	14,714	15,001	15,024	15,024	-1%
Leon	Queen City	594	594	594	594	594	594	0
Leon	Sparta	21	21	21	21	21	21	0
Leon	Yegua-Jackson	0	0	0	0	0	0	(reduced from 4 ac-ft/yr)
Madison	Carrizo-Wilcox	2,862	2,770	2,656	2,554	2,544	2,544	0
Madison	Queen City	380	380	380	380	380	380	0
Madison	Sparta	3,320	3,322	3,322	3,322	3,322	3,322	0
Madison	Yegua-Jackson	810	810	810	810	810	810	-28%

\*GMA 12 models extended to 2069; MAG values for 2069 shown here for 2070 decade.

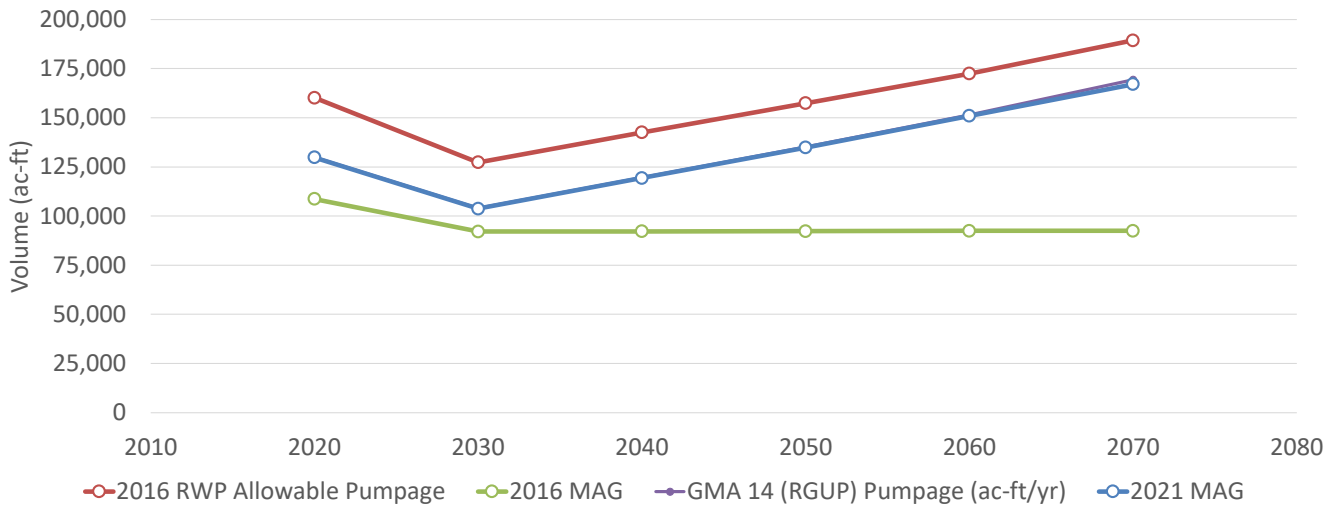
## Agenda Item 8 Groundwater Availability

### Gulf Coast Aquifer – GMA 14 MAG 2020 (ac-ft/yr)



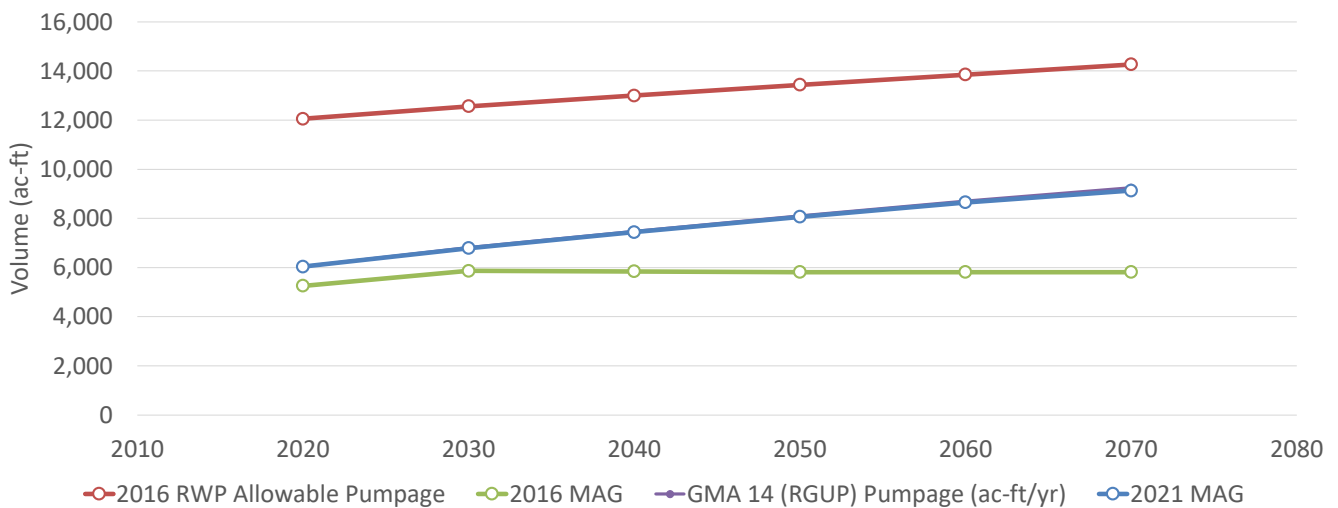
## Agenda Item 8 Groundwater Availability

### Fort Bend County



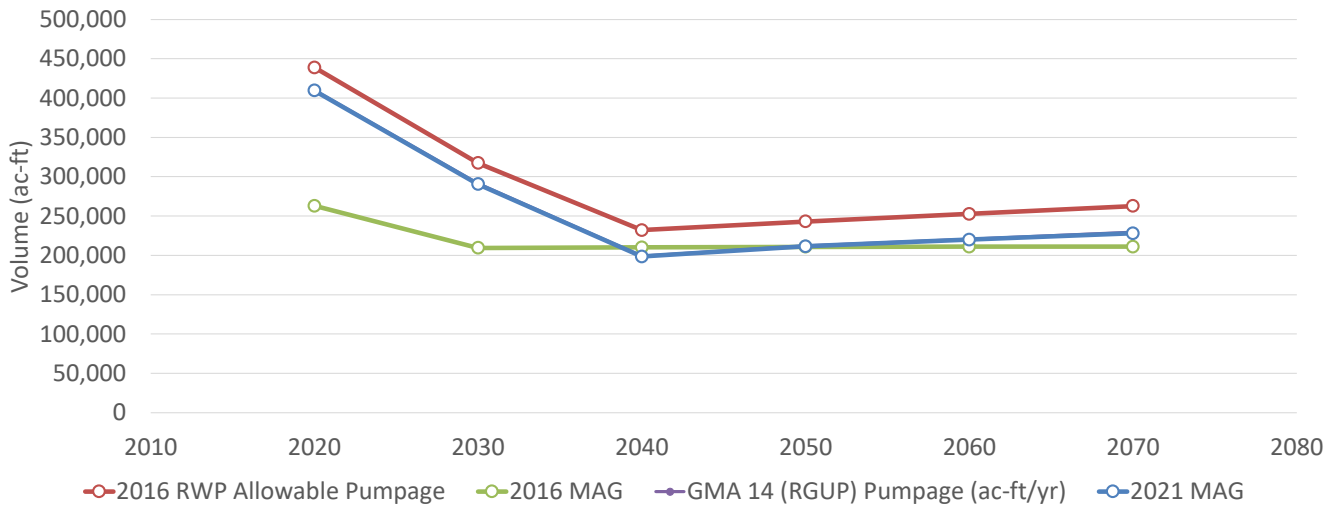
## Agenda Item 8 Groundwater Availability

### Galveston County

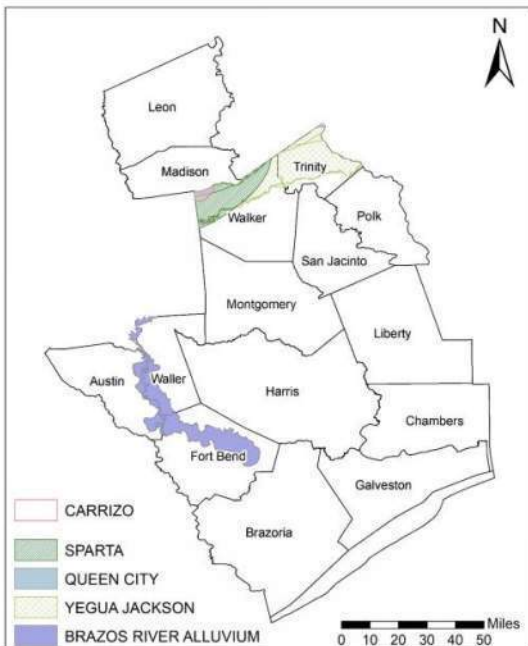


## Agenda Item 8 Groundwater Availability

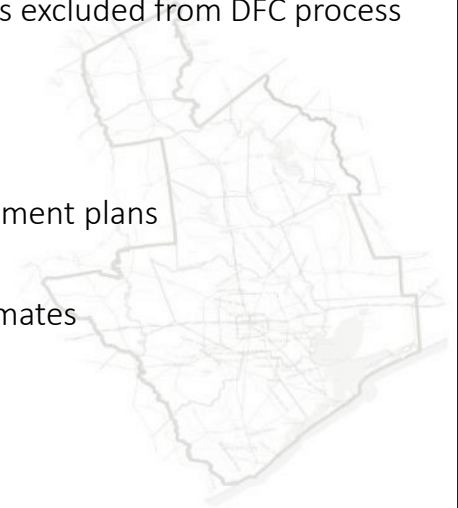
### Harris County



## Agenda Item 8 Groundwater Availability



- Non-MAG Supplies – up to RWPG determination
  - Portions of aquifers excluded from DFC process
  - Local supplies
- Data sources
  - Local GCD management plans
  - TWDB GAMs
  - Previous RWP estimates



## Agenda Item 8 Groundwater Availability

### 2016 RWP Supplies

Aquifer	County	Available Groundwater (ac-ft/yr)					
		2020	2030	2040	2050	2060	2070
Brazos River Alluvium	Austin	7,944	7,944	7,944	7,944	7,944	7,944
Brazos River Alluvium	Waller	12,027	12,027	12,027	12,027	12,027	12,027
Carrizo-Wilcox	Walker	2,099	2,099	2,099	2,099	2,099	2,099
Gulf Coast   Catahoula Formation*	Montgomery	4,391	4,391	4,391	4,391	4,391	4,391
Queen City	Trinity	0	0	0	0	0	0
Queen City	Walker	229	229	229	229	229	229
San Bernard River Alluvium	Austin	520	520	520	520	520	520
San Jacinto River Alluvium	Walker	1,450	1,450	1,450	1,450	1,450	1,450
Sparta	Walker	2,350	2,350	2,350	2,350	2,350	2,350
Trinity River Alluvium	Walker	3,913	3,913	3,913	3,913	3,913	3,913
Yegua-Jackson	Trinity	2,191	2,191	2,191	2,191	2,191	2,191
Yegua-Jackson	Walker	4,174	4,174	4,174	4,174	4,174	4,174

\* Catahoula Aquifer supplies based on historical use.

## Agenda Item 8 Groundwater Availability

- Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson
  - Option: use values in 2016 RWP
  - Option: extract pumping from GAM Run 17-030 (GMA 12)
- Brazos River Alluvium Aquifer
  - Option: use values in 2016 RWP (from 2011 GTA Aquifer Assessment)
  - Option: extract pumping from GAM Run 17-030 (GMA 12)
- Other alluvium formations
  - Option: use values in 2016 RWP (from 2011 GTA Aquifer Assessment)
- Groundwater Supply Committee recommendation of 2016 RWP values



## **Agenda Item 8**

### **Groundwater Availability**

#### **Action:**

Approve groundwater supply estimates for use in the  
2021 Region H RWP.





## Agenda Item 9

Receive report from Consultant Team and Groundwater Supply Committee regarding MAG Peak Factors and consider taking action to authorize Consultant Team to coordinate with groundwater regulatory entities to develop peak factors for Region H and submit an associated request to TWDB.



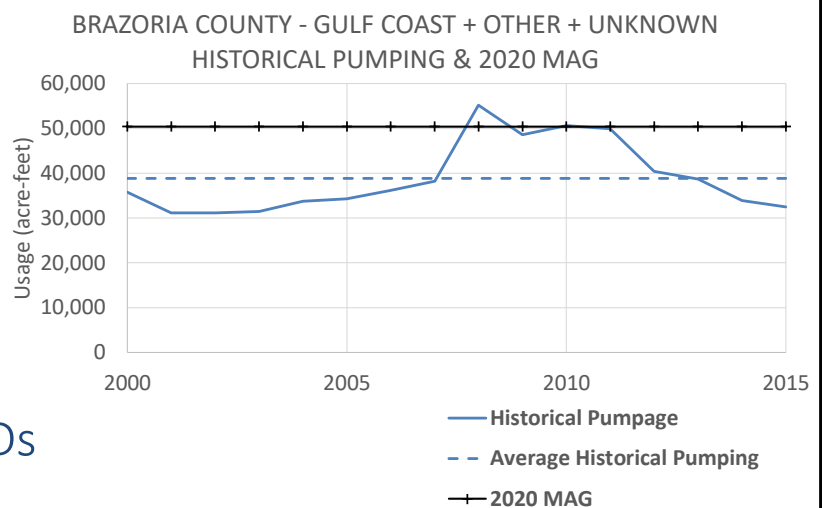
## Agenda Item 9 MAG Peak Factors

- Percentage factor (>100%) applied to MAG volumes
- Applied for each decade
- Requires approval prior to IPP
  - From GCD (if applicable), GMA, and EA

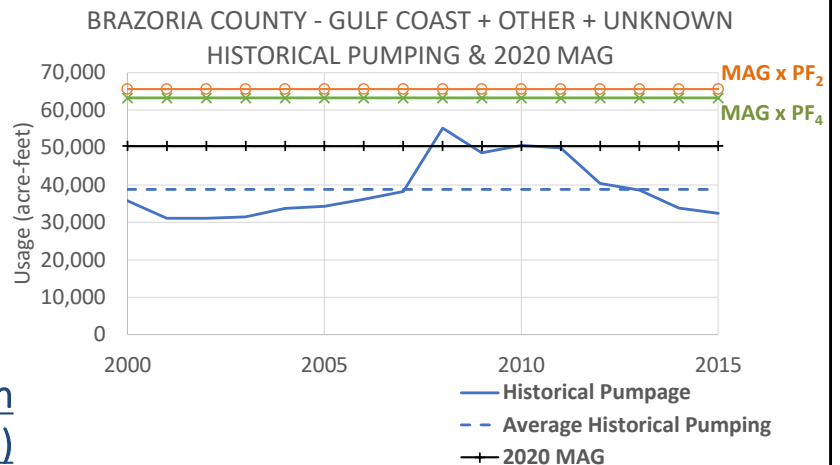


## Agenda Item 9 MAG Peak Factors

- Addresses concerns from 2016 RWP
- Allows for pumping > MAG in drought years
- Should not prevent GCDs from achieving DFCs



## Agenda Item 9 MAG Peak Factors



Proposed methodology based on historical pumping (2000 – 2015)

- (142%) PF<sub>1</sub> = largest pump volume / average
- (130%) PF<sub>2</sub> = 2<sup>nd</sup> largest pump volume / average
- (141%) PF<sub>3</sub> = largest pump volume / linear prediction
- (126%) PF<sub>4</sub> = 2<sup>nd</sup> largest pump volume / linear prediction

## Agenda Item 9 MAG Peak Factors

- May be formation and location specific
- Various local regulatory structures
- Groundwater Supply Committee suggests additional analysis and Committee review
- Coordination with Consultant Team, Committee, GCDs, Subsidence Districts, and GMAs

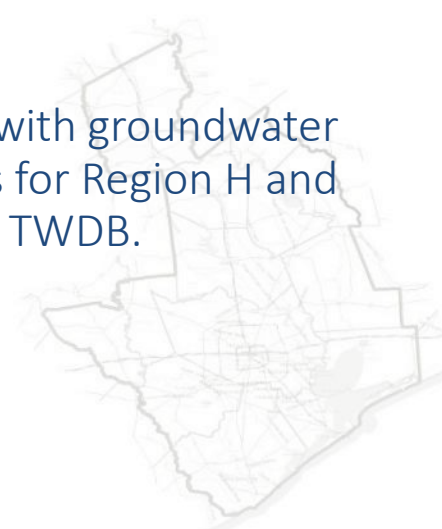


## **Agenda Item 9**

### **MAG Peak Factors**

#### **Action:**

Authorize Consultant Team to coordinate with groundwater regulatory entities to develop peak factors for Region H and submit an associated request to TWDB.





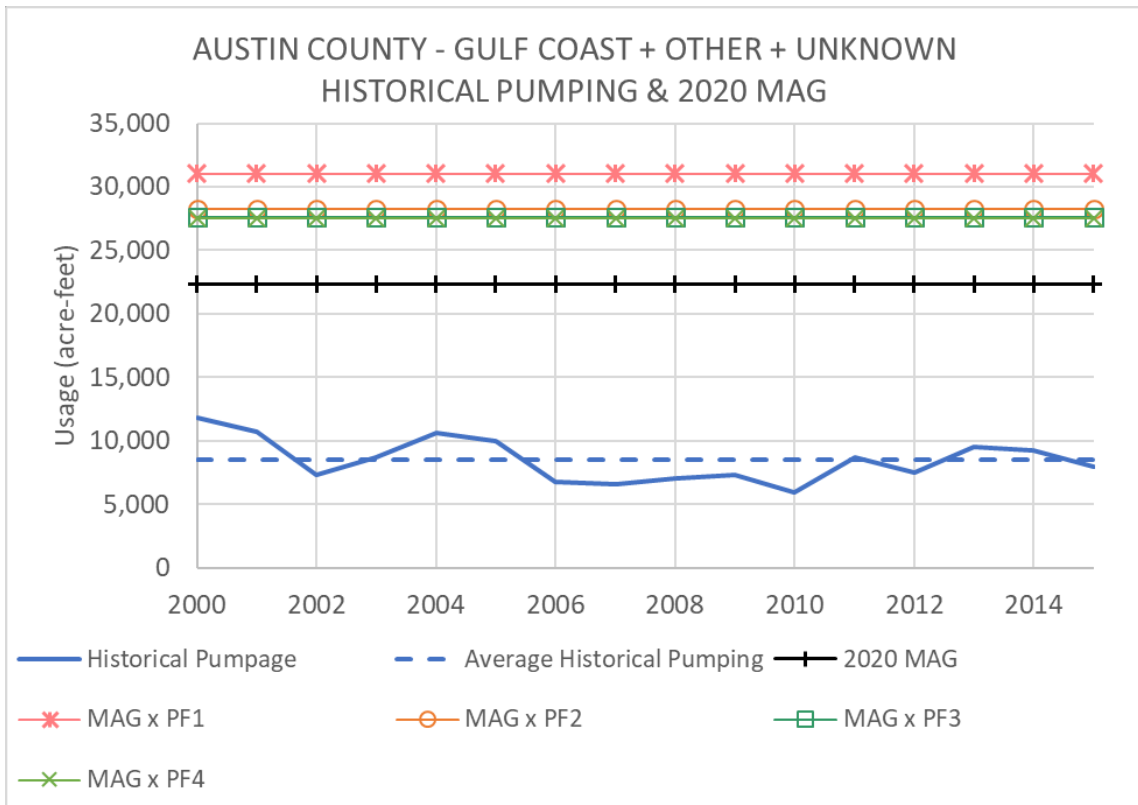
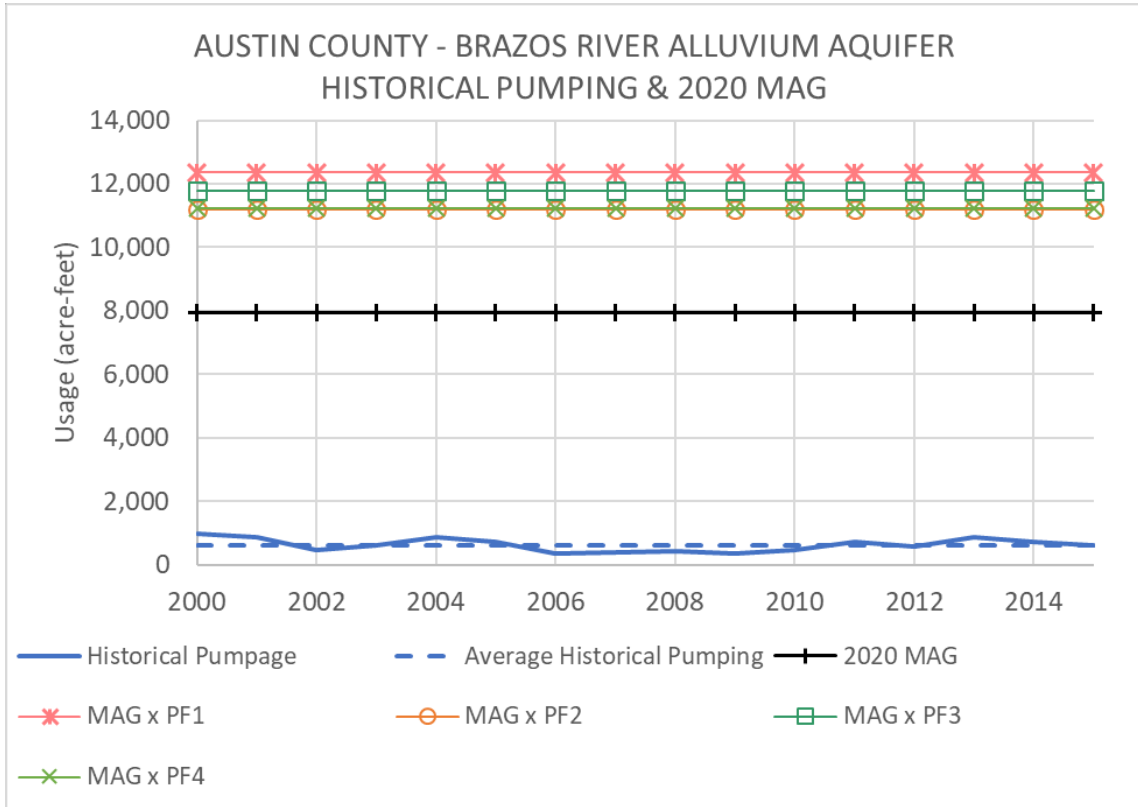


2021 Region H RWP  
Potential MAG Peak Factor Methodology

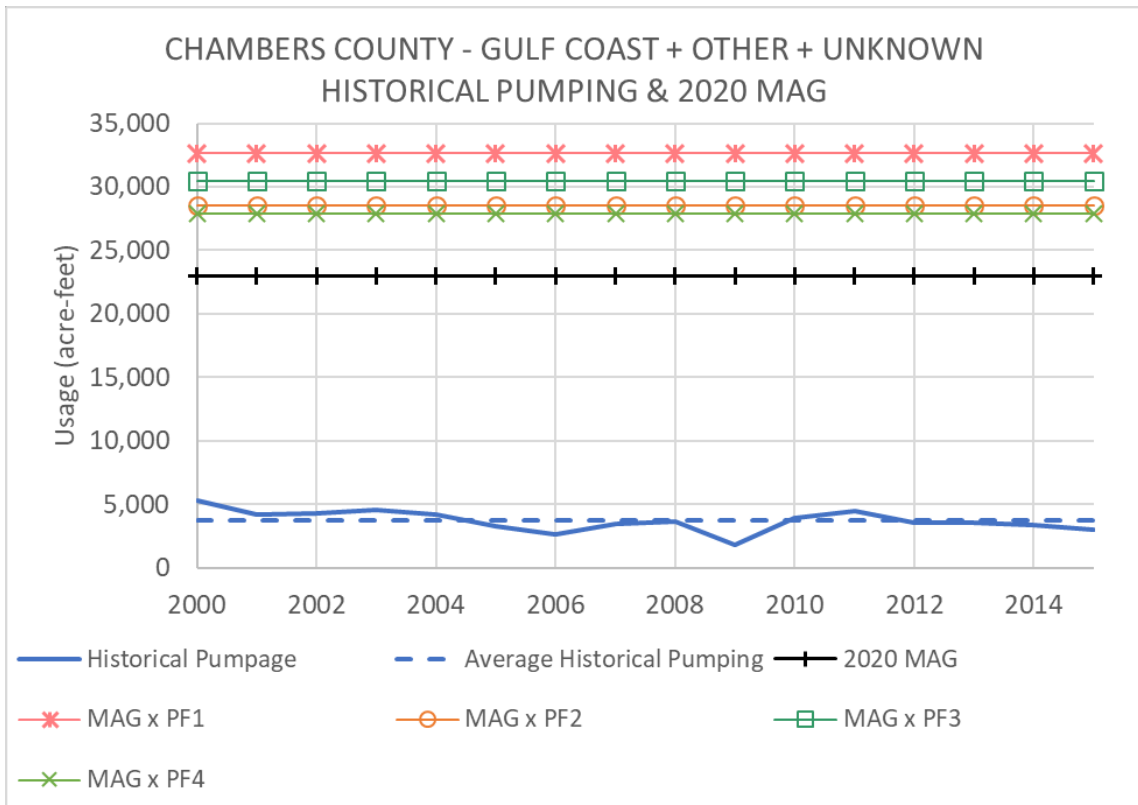
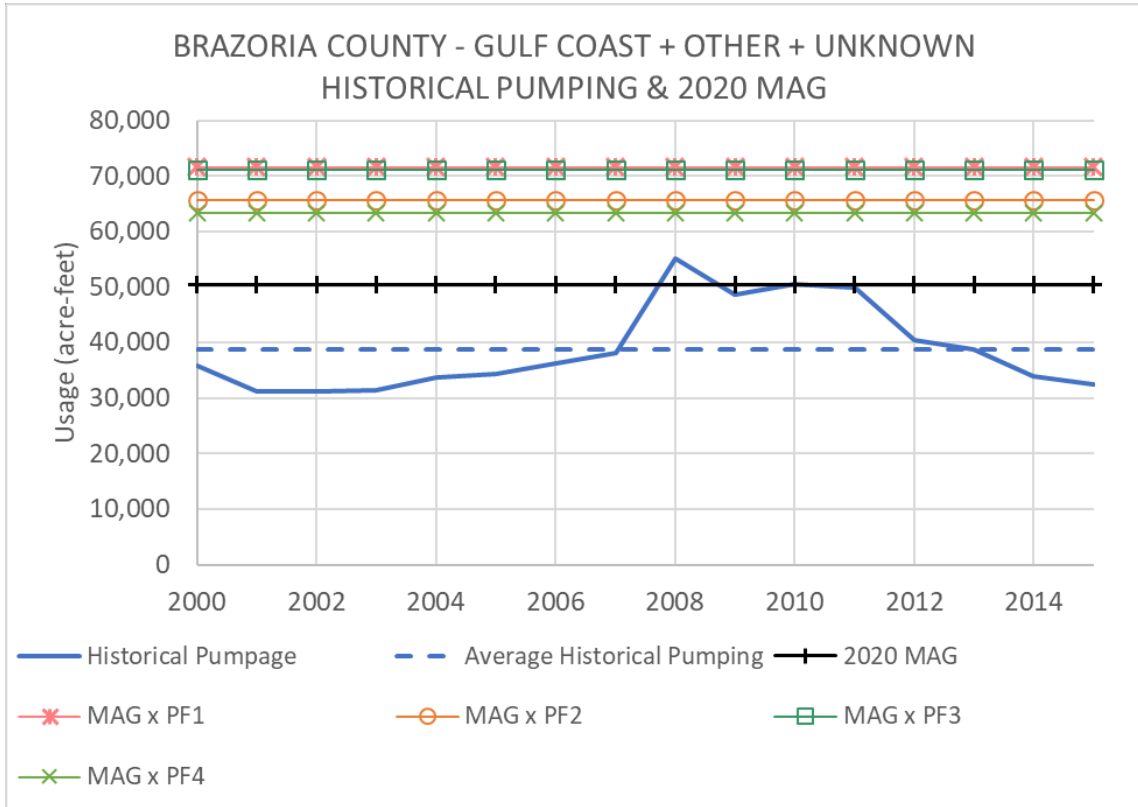
GMA	County	Aquifer	Peaking Factor Options*			
			PF1	PF2	PF3	PF4
14	AUSTIN	GULF COAST AQUIFER	1.39	1.26	1.24	1.14
14	AUSTIN	BRAZOS RIVER ALLUVIUM AQUIFER	1.56	1.41	1.41	1.35
14	AUSTIN	GULF COAST + OTHER + UNKNOWN	1.39	1.27	1.24	1.14
14	BRAZORIA	GULF COAST AQUIFER	1.55	1.36	1.56	1.37
14	BRAZORIA	GULF COAST + OTHER + UNKNOWN	1.42	1.30	1.41	1.26
14	CHAMBERS	GULF COAST AQUIFER	1.53	1.34	1.17	1.13
14	CHAMBERS	GULF COAST + OTHER + UNKNOWN	1.42	1.24	1.21	1.13
14	FORT BEND	GULF COAST AQUIFER	1.35	1.21	1.40	1.17
14	FORT BEND	GULF COAST + OTHER + UNKNOWN	1.30	1.23	1.31	1.24
14	GALVESTON	GULF COAST AQUIFER	2.48	2.05	3.76	1.19
14	GALVESTON	GULF COAST + OTHER + UNKNOWN	2.51	2.02	3.70	1.19
14	HARRIS	GULF COAST AQUIFER	1.55	1.33	1.06	0.96
14	HARRIS	GULF COAST + OTHER + UNKNOWN	1.32	1.16	1.14	1.10
12	LEON	CARRIZO-WILCOX AQUIFER	1.20	1.16	1.22	1.12
12	LEON	QUEEN CITY AQUIFER	1.49	1.38	1.06	1.16
12	LEON	SPARTA AQUIFER	1.64	1.50	1.68	1.48
14	LIBERTY	GULF COAST AQUIFER	1.44	1.39	1.03	1.04
14	LIBERTY	GULF COAST + OTHER + UNKNOWN	1.30	1.26	1.06	1.06
12	MADISON	CARRIZO-WILCOX AQUIFER	2.21	2.12	1.50	1.06
12	MADISON	QUEEN CITY AQUIFER	1.48	1.28	1.57	1.17
12	MADISON	SPARTA AQUIFER	1.31	1.27	1.17	1.07
12	MADISON	YEGUA-JACKSON AQUIFER	2.16	2.00	1.49	1.27
14	MONTGOMERY	GULF COAST AQUIFER	1.29	1.24	1.31	1.25
14	MONTGOMERY	GULF COAST + OTHER + UNKNOWN	1.49	1.26	1.33	1.10
14	POLK	GULF COAST AQUIFER	1.19	1.18	1.16	1.13
14	POLK	GULF COAST + OTHER + UNKNOWN	1.20	1.15	1.14	1.11
14	SAN JACINTO	GULF COAST AQUIFER	1.61	1.21	1.40	0.92
14	SAN JACINTO	GULF COAST + OTHER + UNKNOWN	1.48	1.11	1.38	0.97
11	TRINITY	YEGUA-JACKSON AQUIFER	2.17	1.99	1.57	1.33
14	WALKER	GULF COAST AQUIFER	1.44	1.30	1.22	0.94
14	WALKER	QUEEN CITY AQUIFER	1.66	1.62	1.64	1.54
14	WALKER	YEGUA-JACKSON AQUIFER	3.50	3.36	2.28	1.29
14	WALKER	GULF COAST + OTHER + UNKNOWN	1.21	1.20	1.15	1.31
14	WALLER	GULF COAST AQUIFER	1.29	1.29	1.08	1.04
14	WALLER	BRAZOS RIVER ALLUVIUM AQUIFER	1.31	1.28	1.08	1.02
14	WALLER	GULF COAST + OTHER + UNKNOWN	1.29	1.27	1.45	1.08

\*Values in blue reflect non-Subsidence District counties with historical pumpage exceeding the MAG for one or more years.

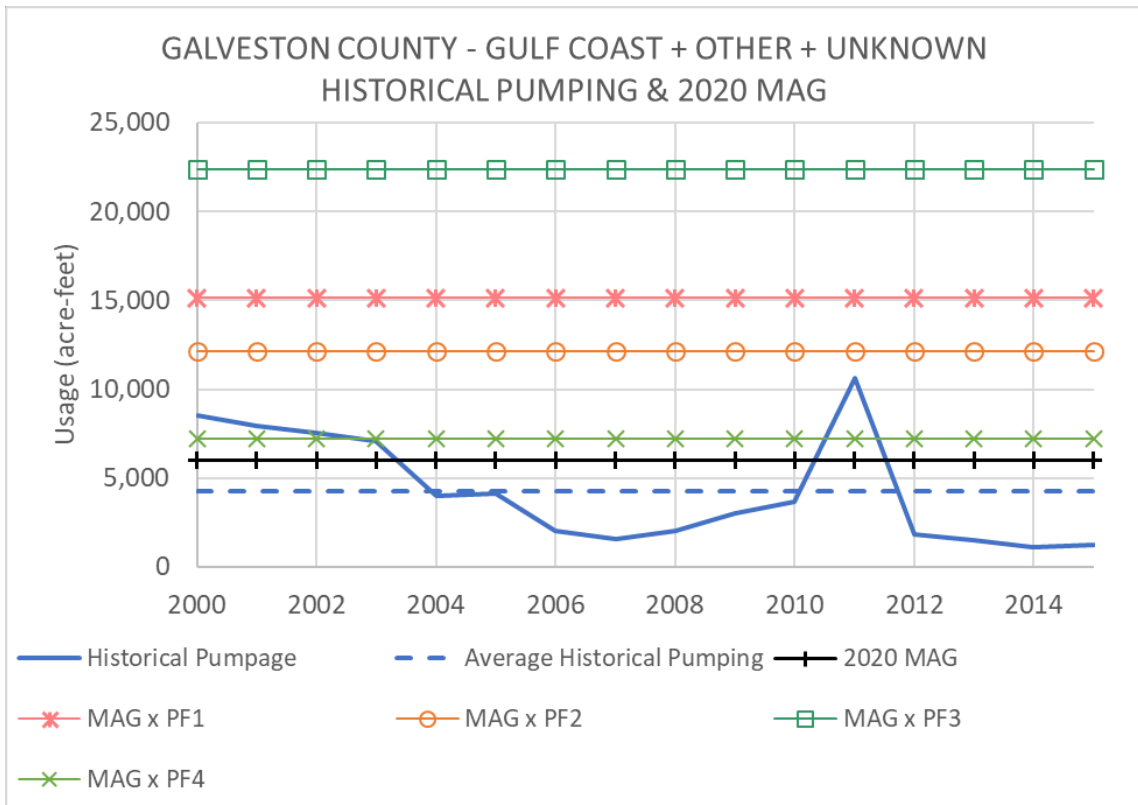
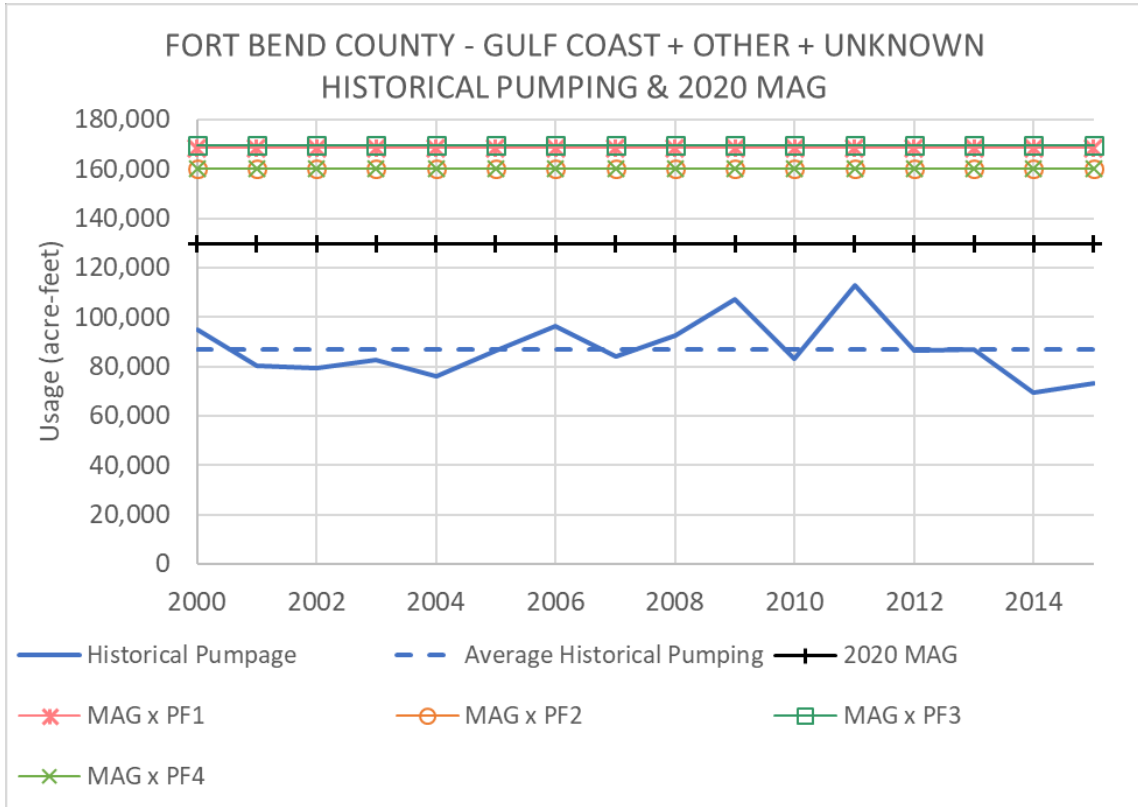
2021 Region H RWP  
 Potential MAG Peak Factor Methodology



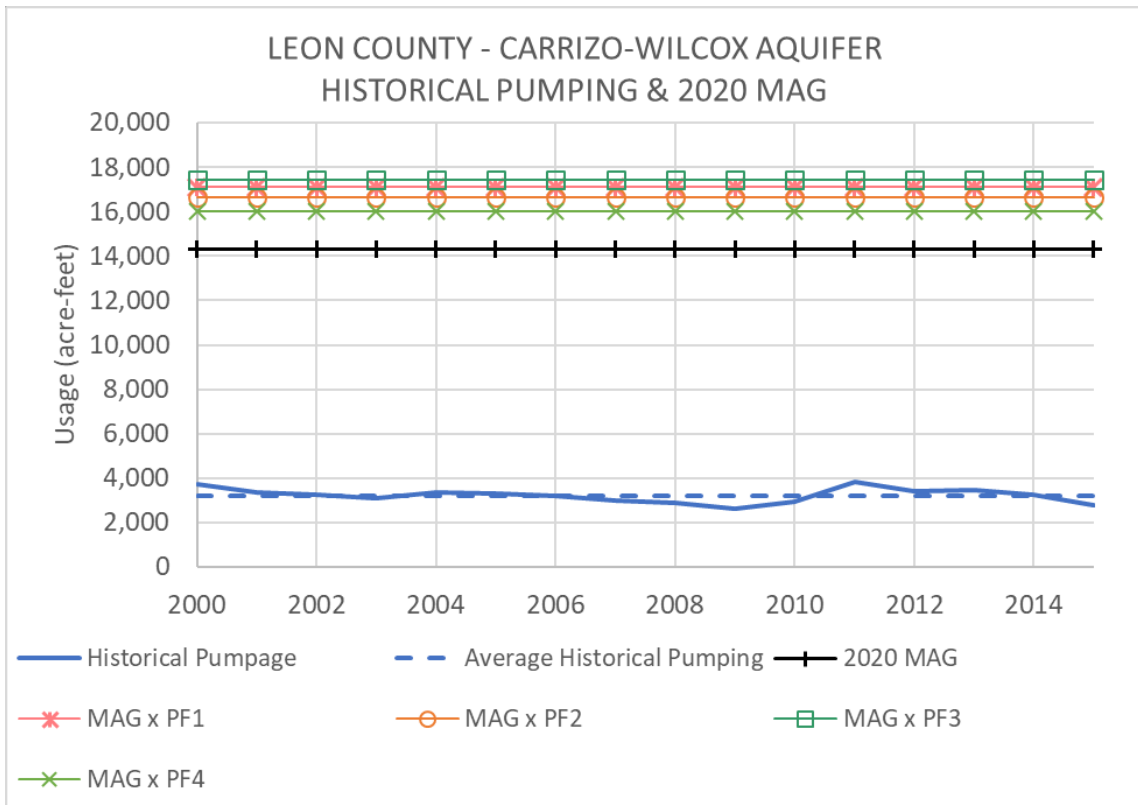
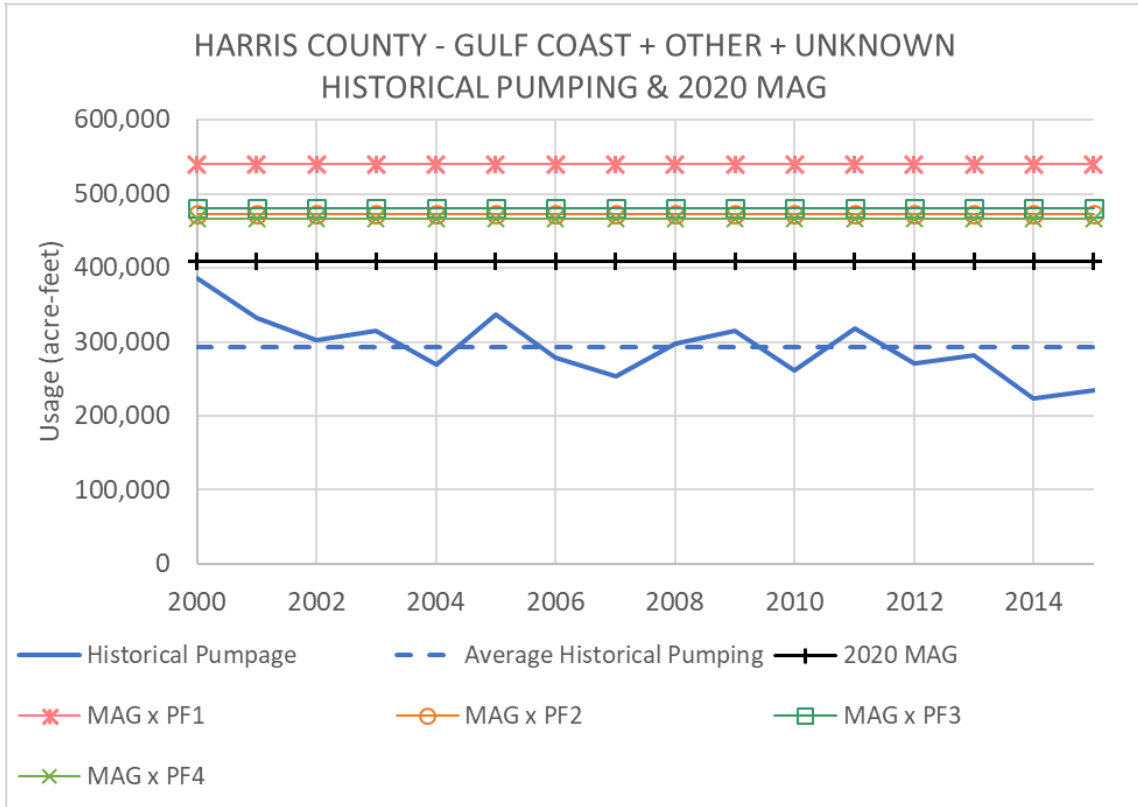
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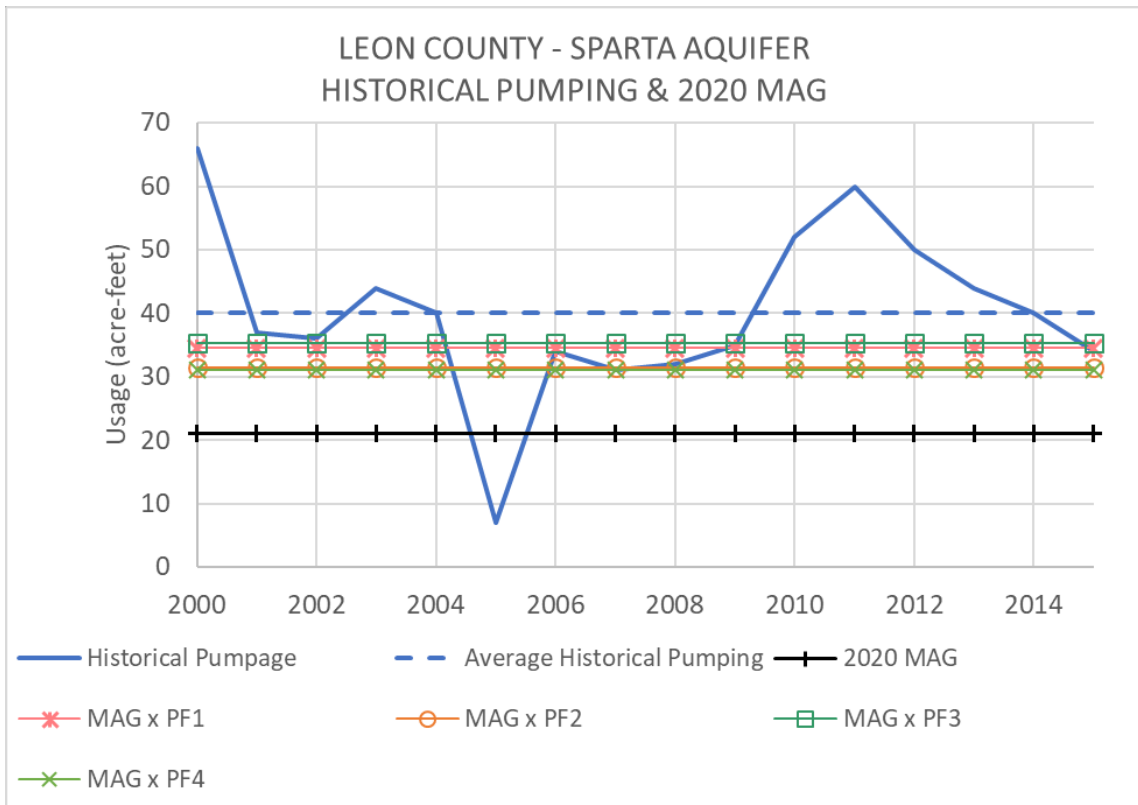
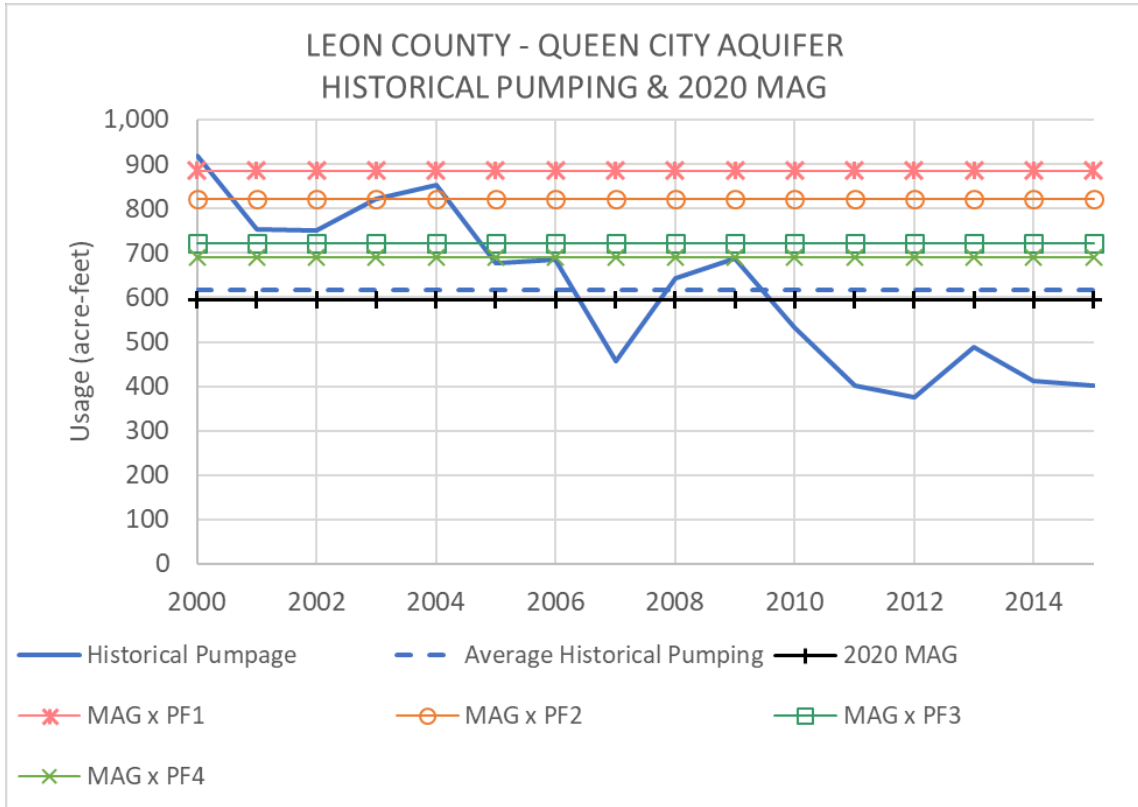
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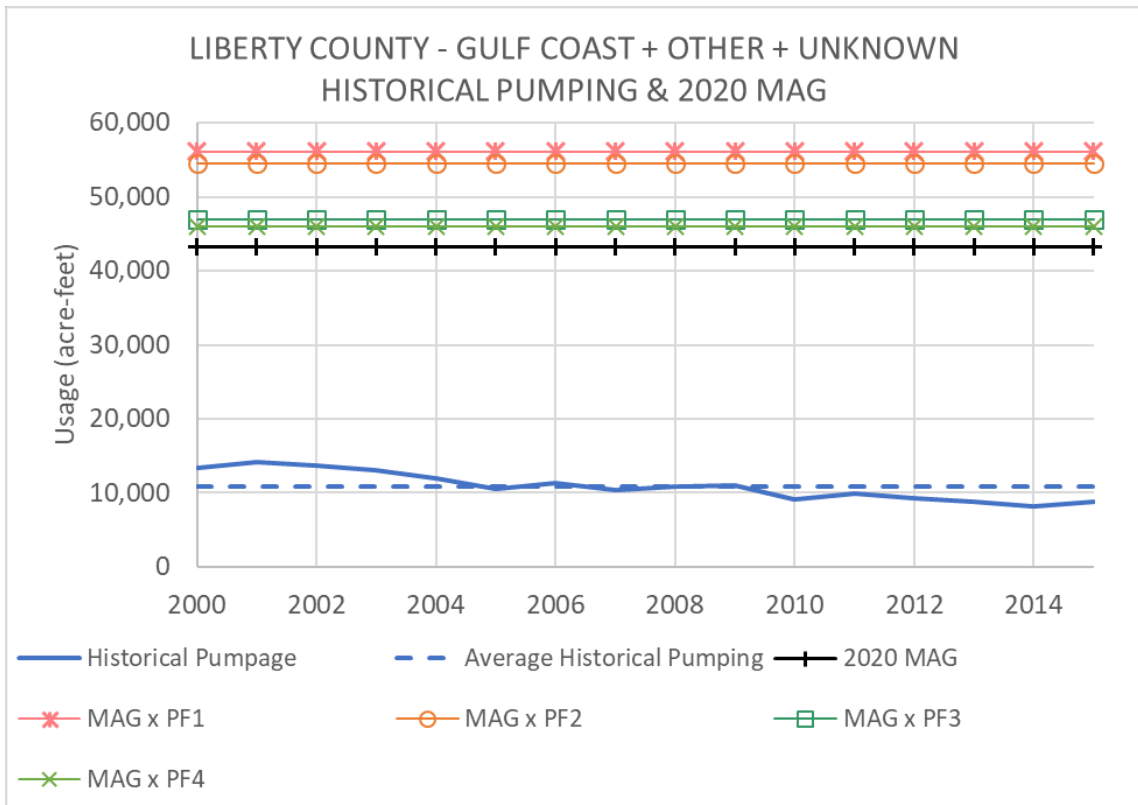
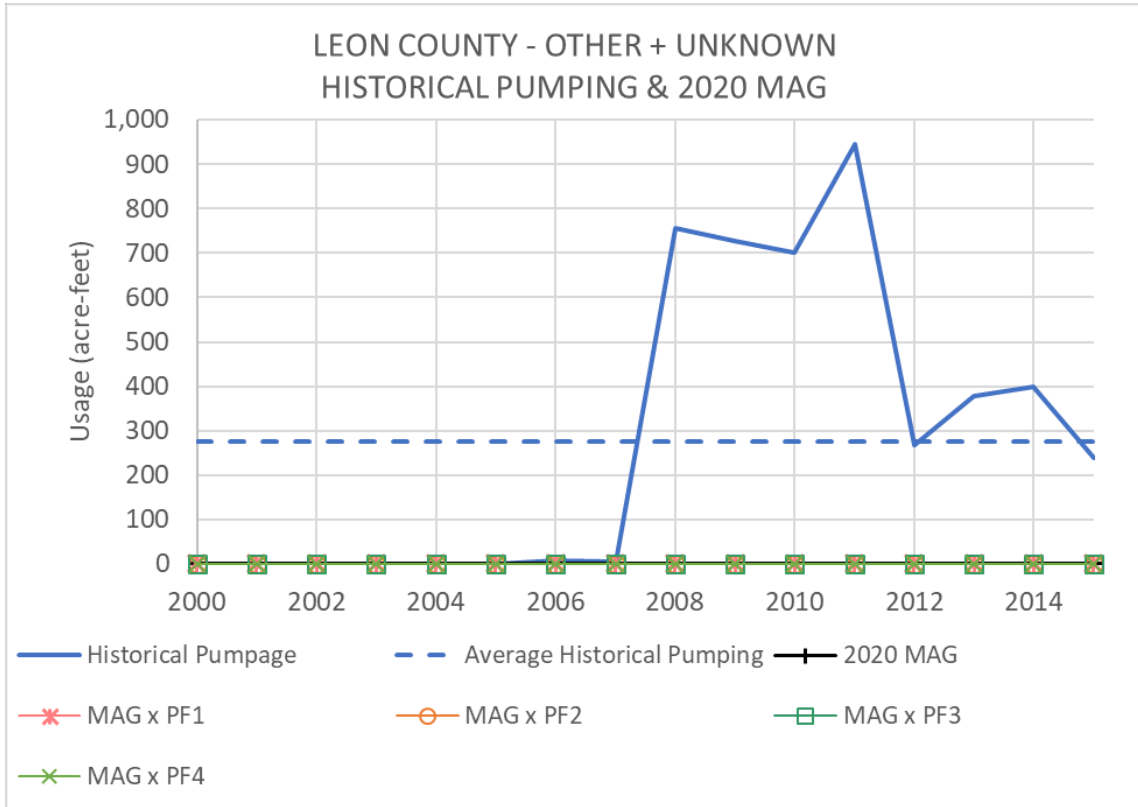
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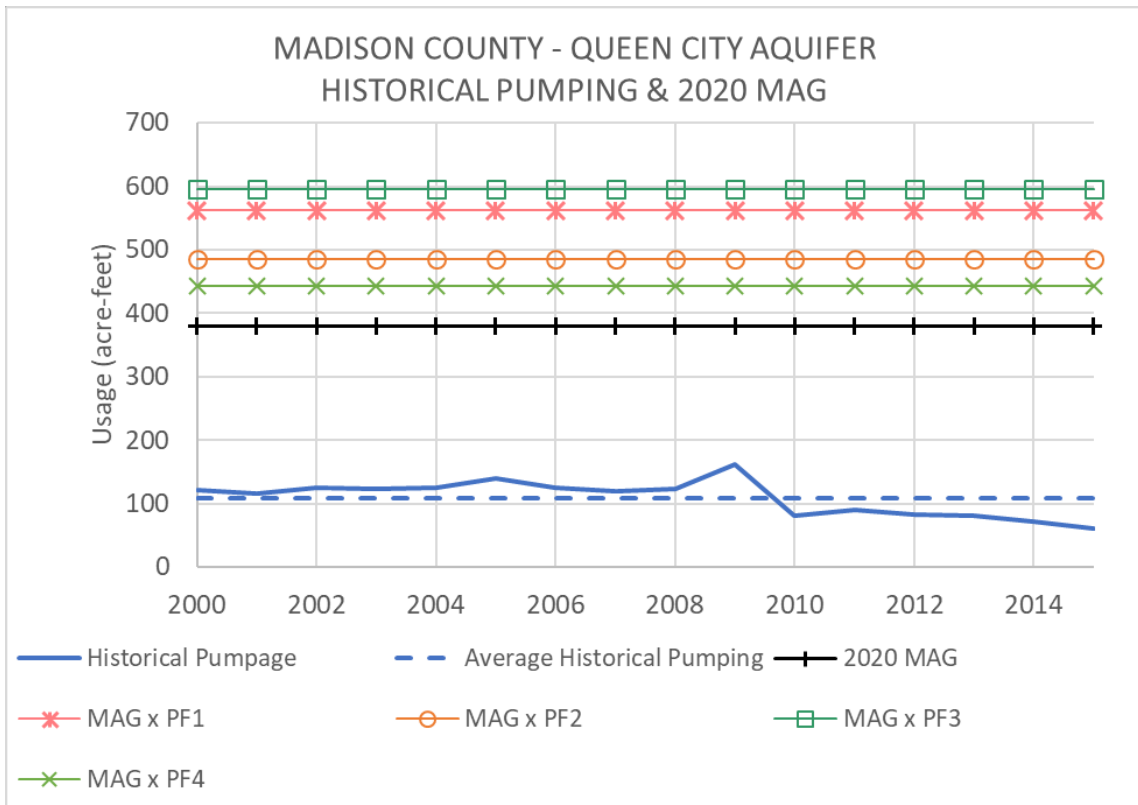
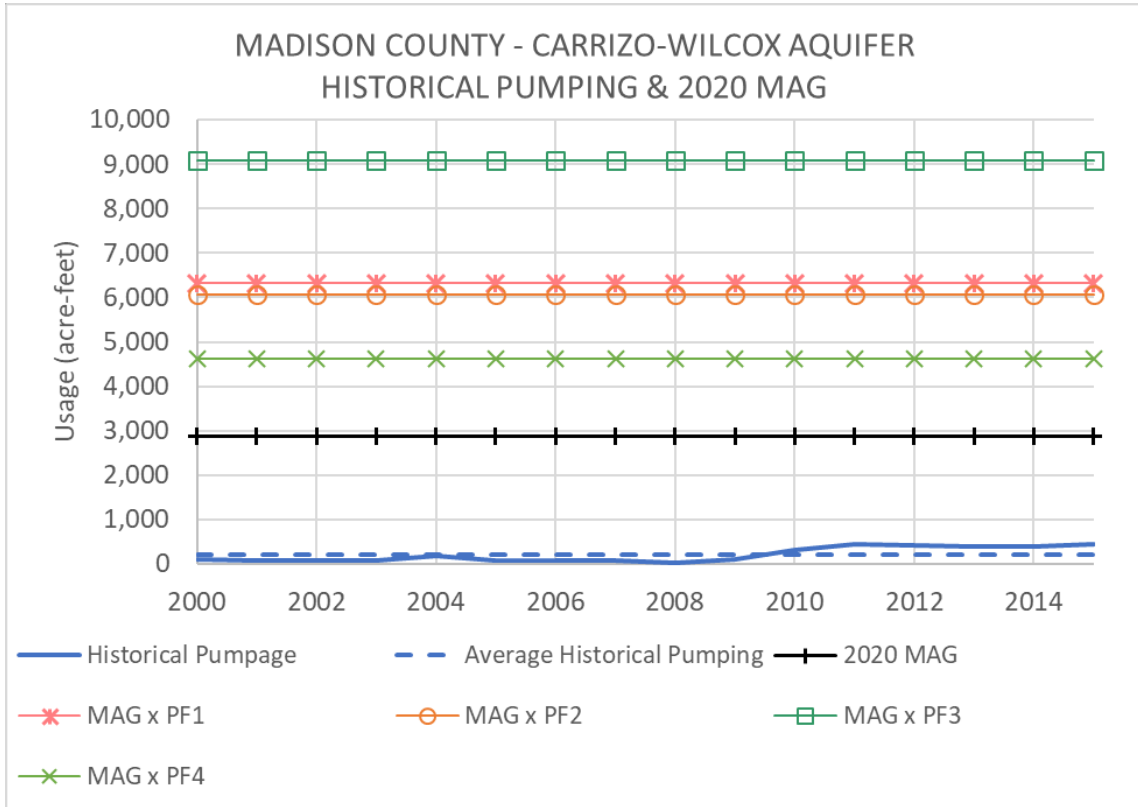
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2021 Region H RWP  
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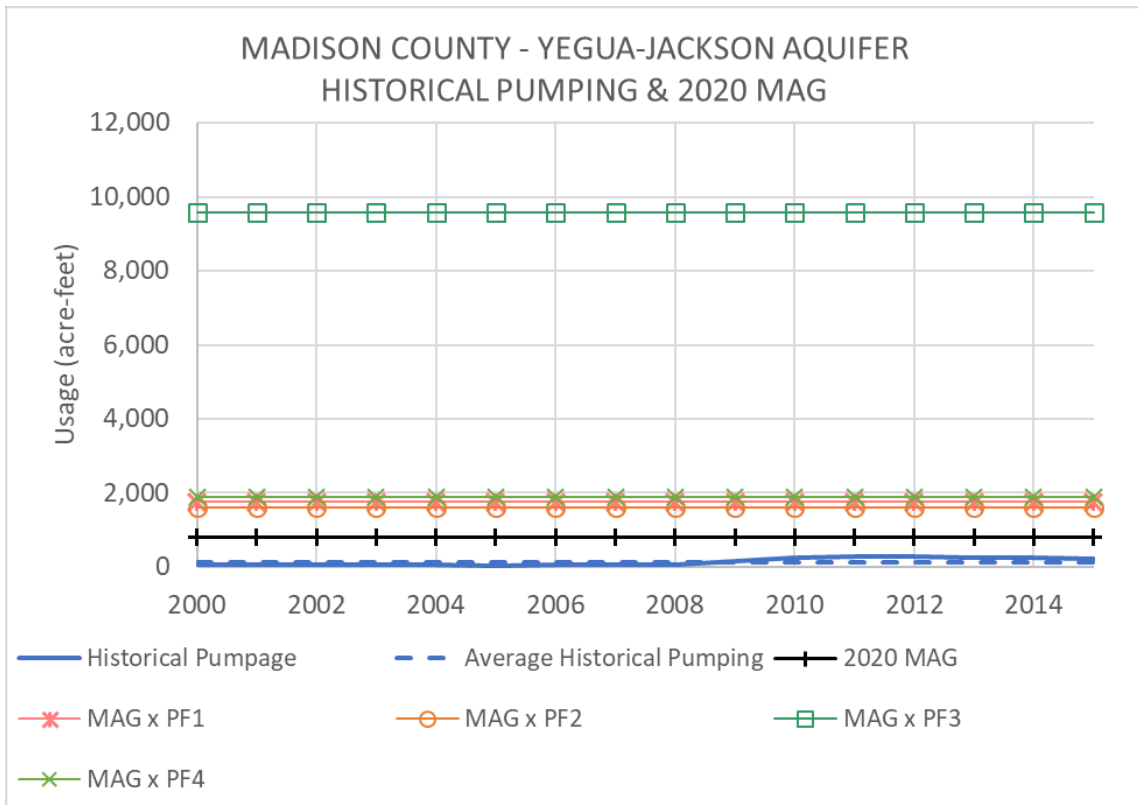
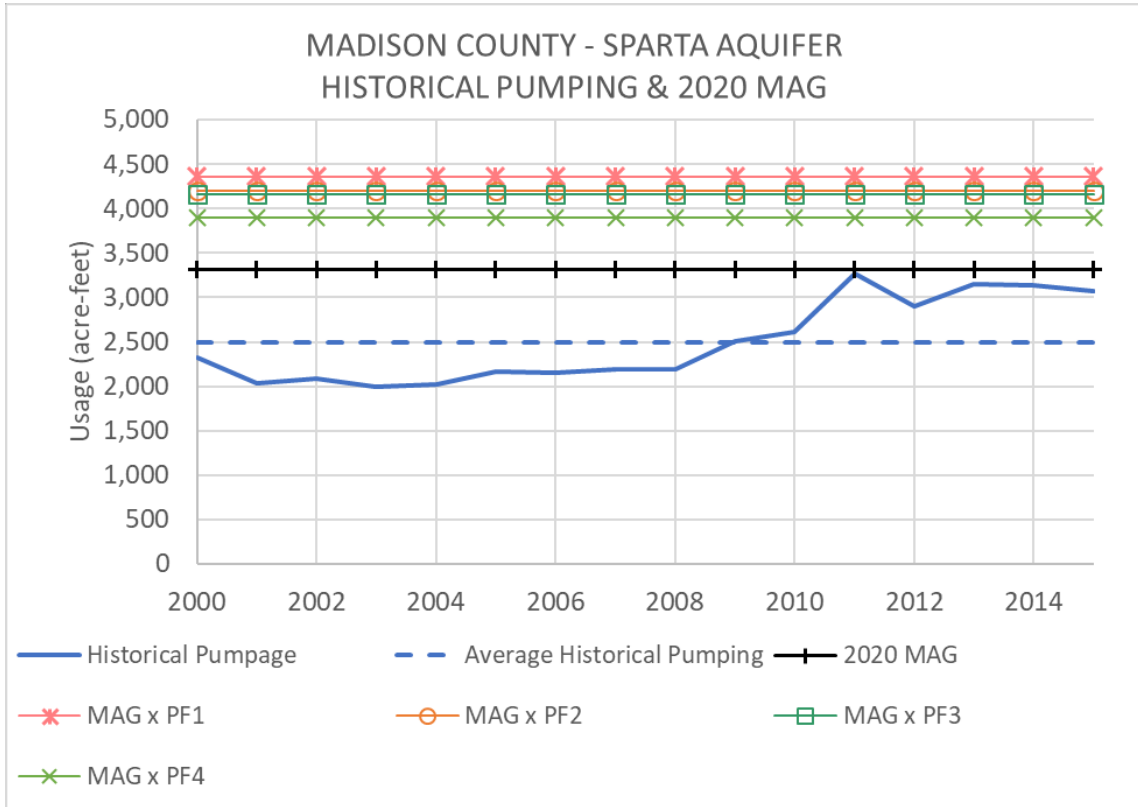


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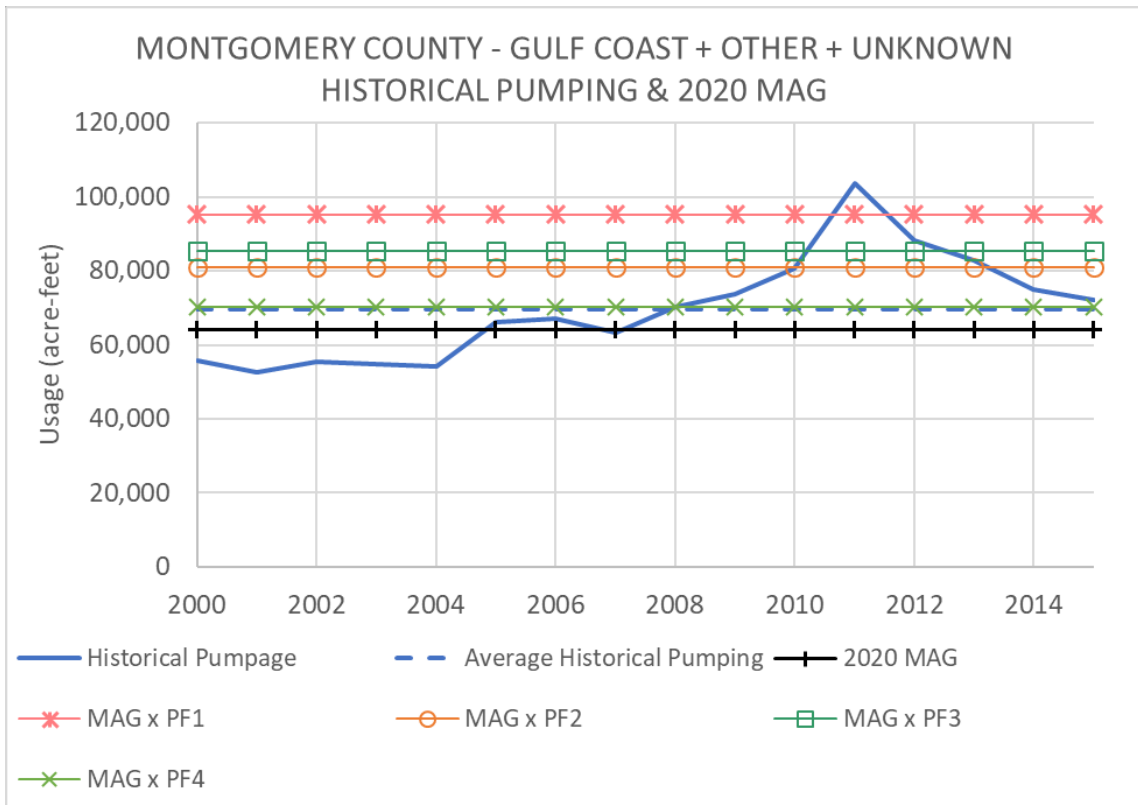
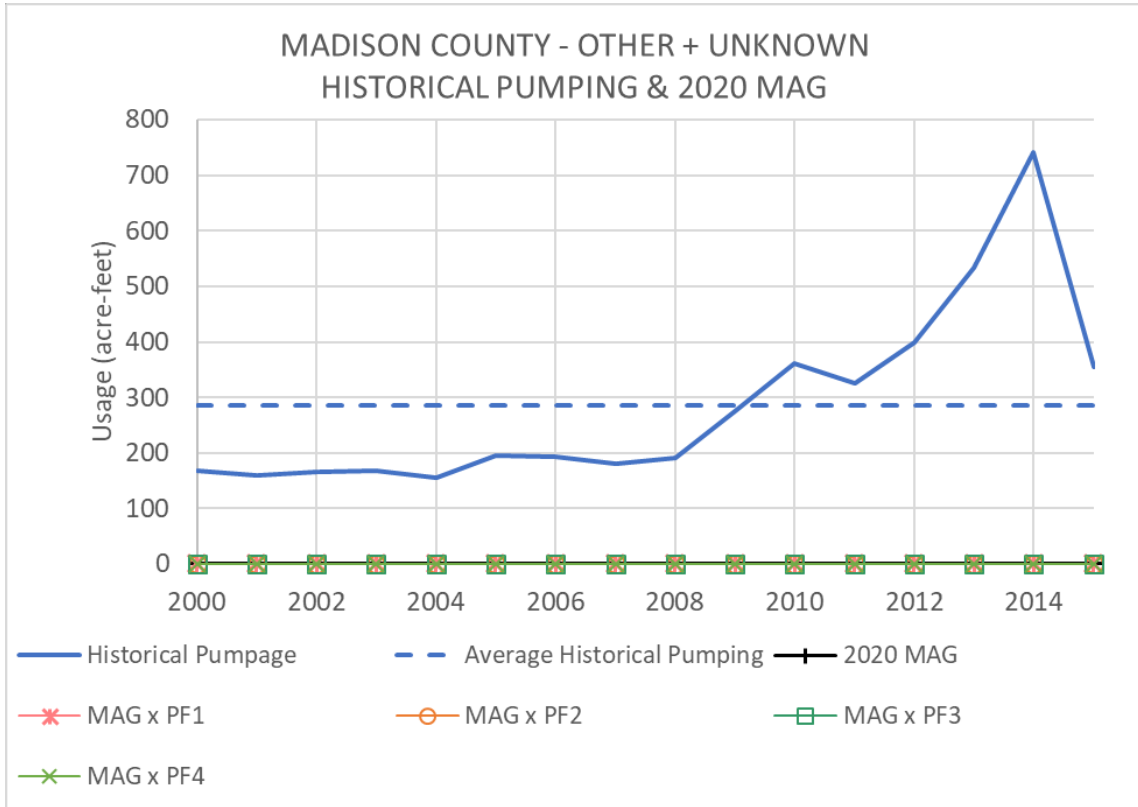




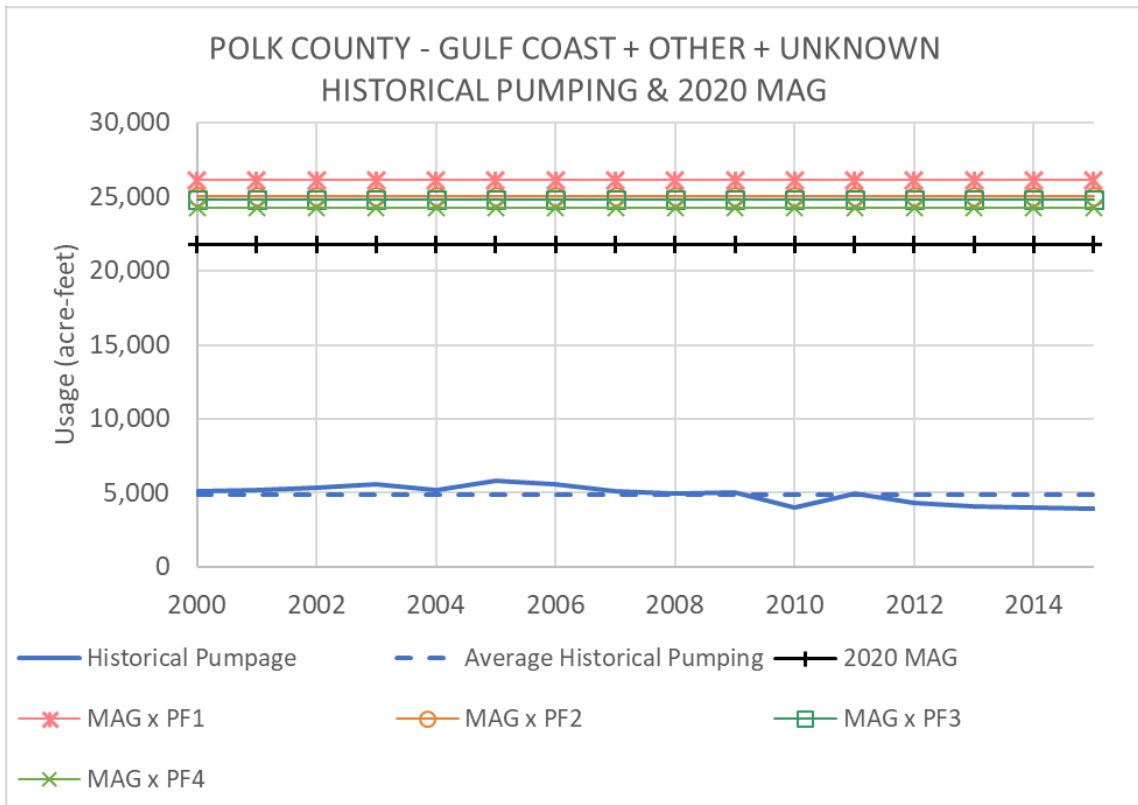
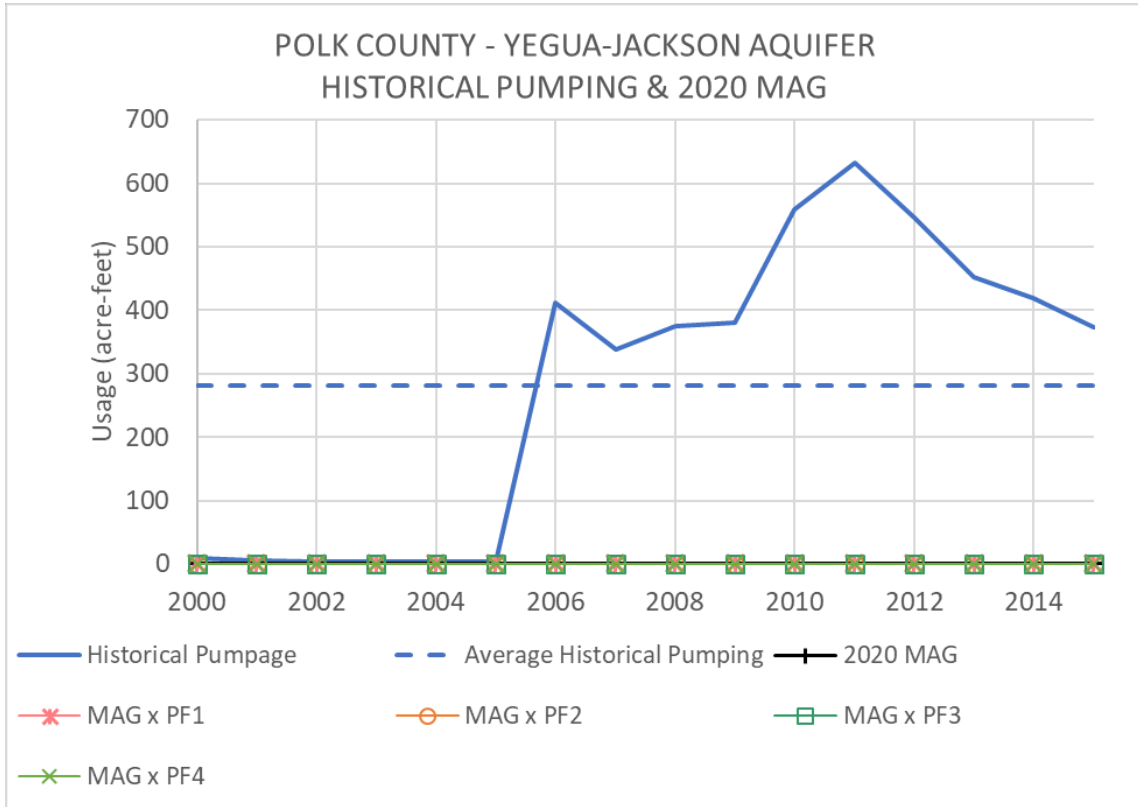
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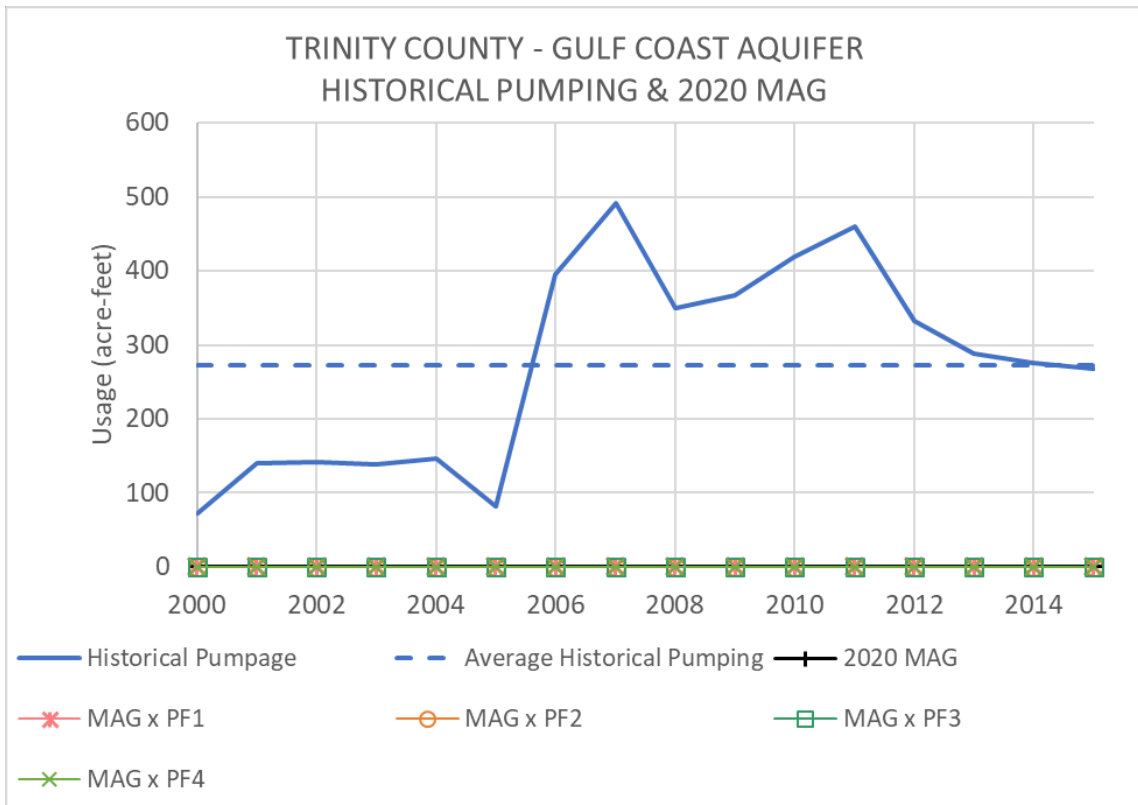
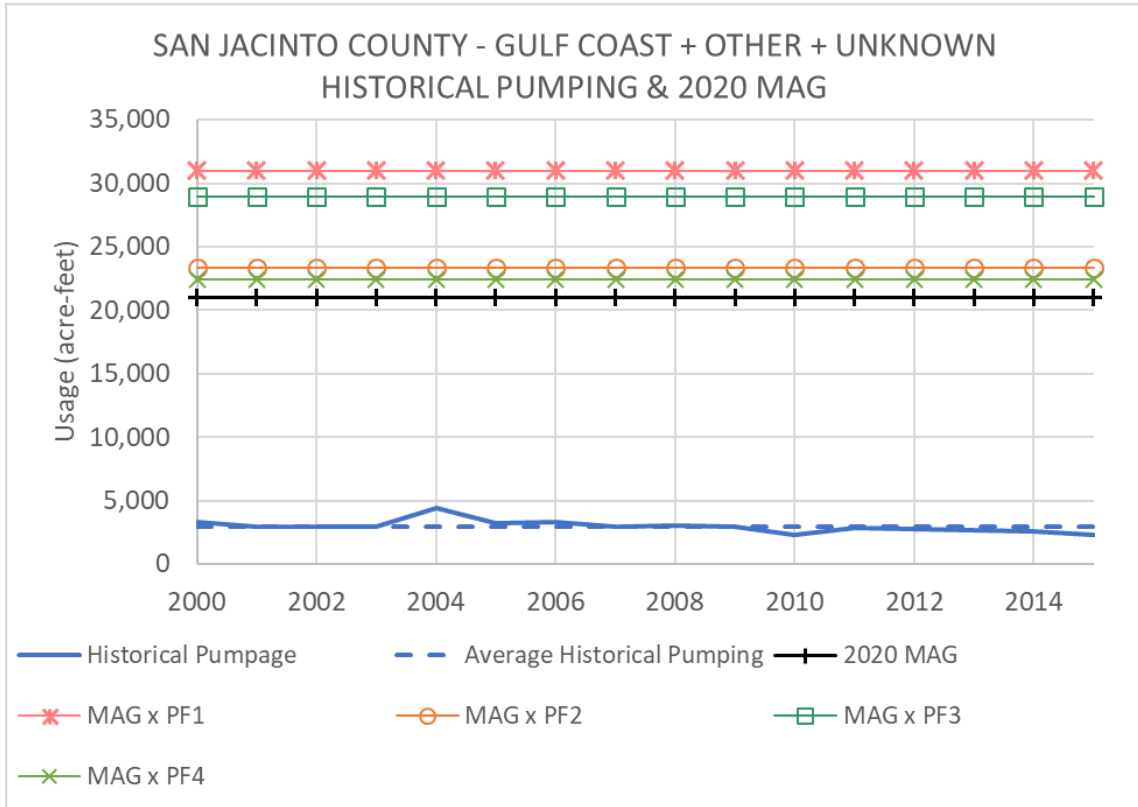
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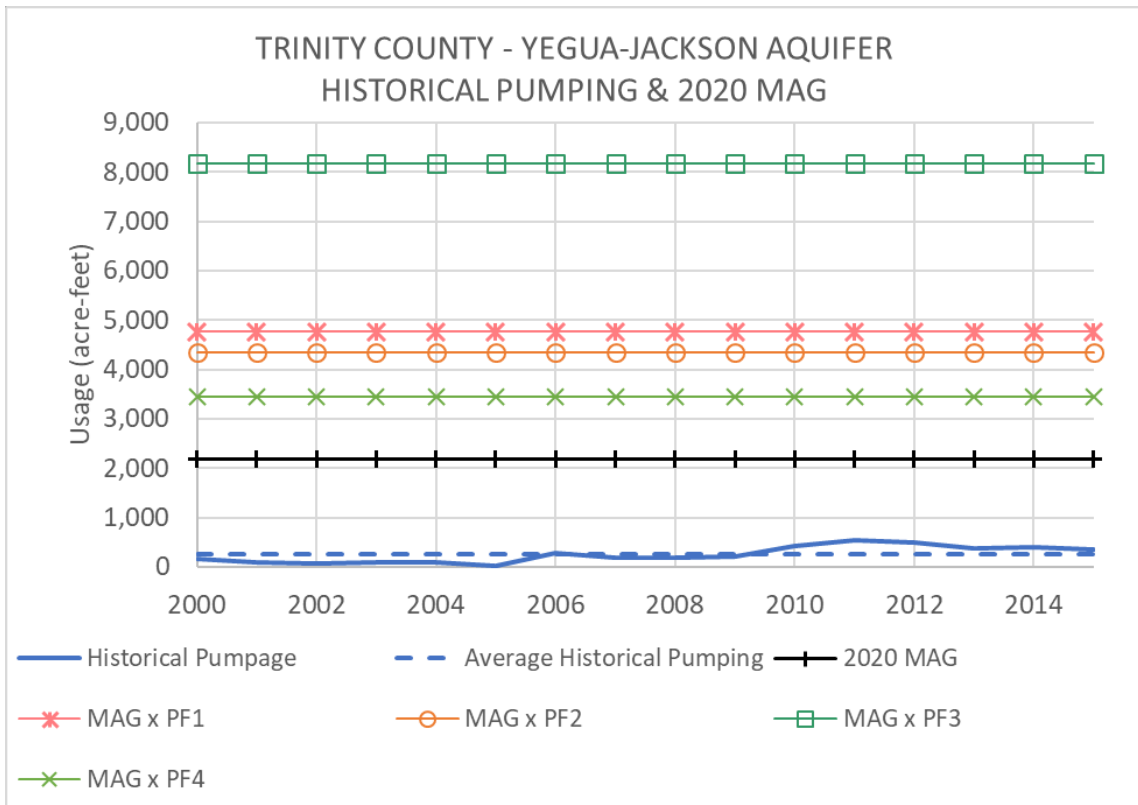
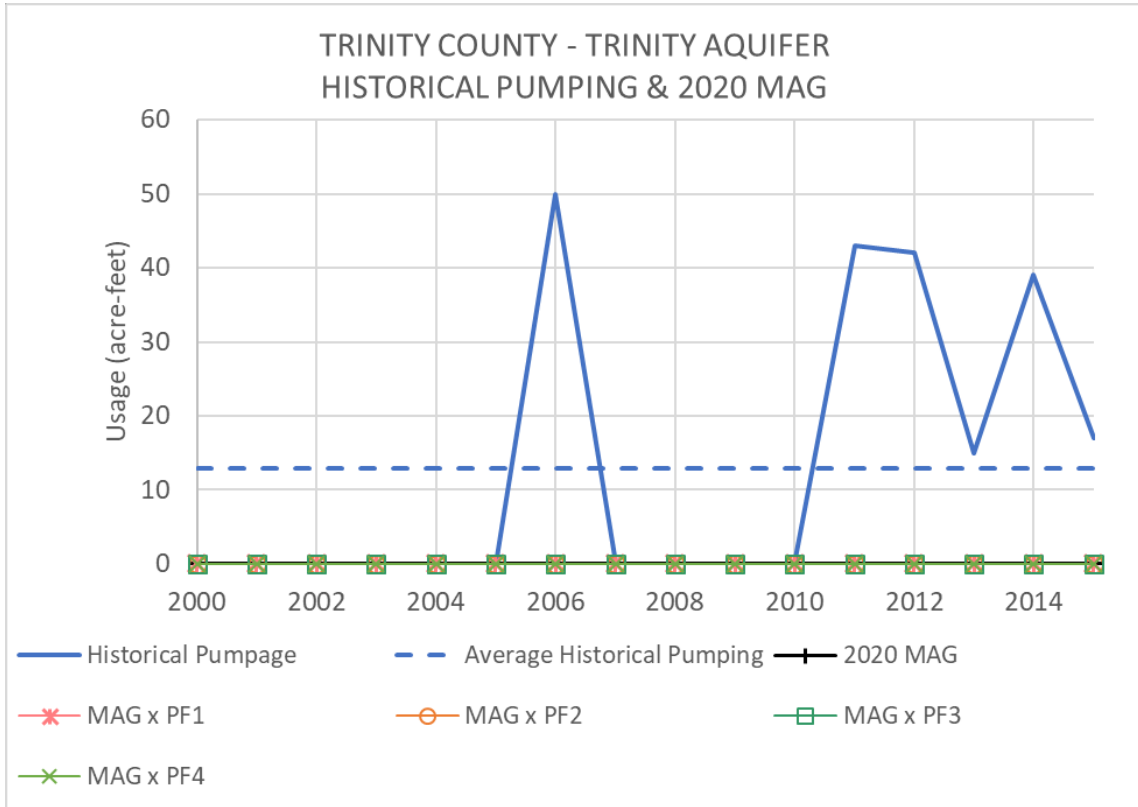
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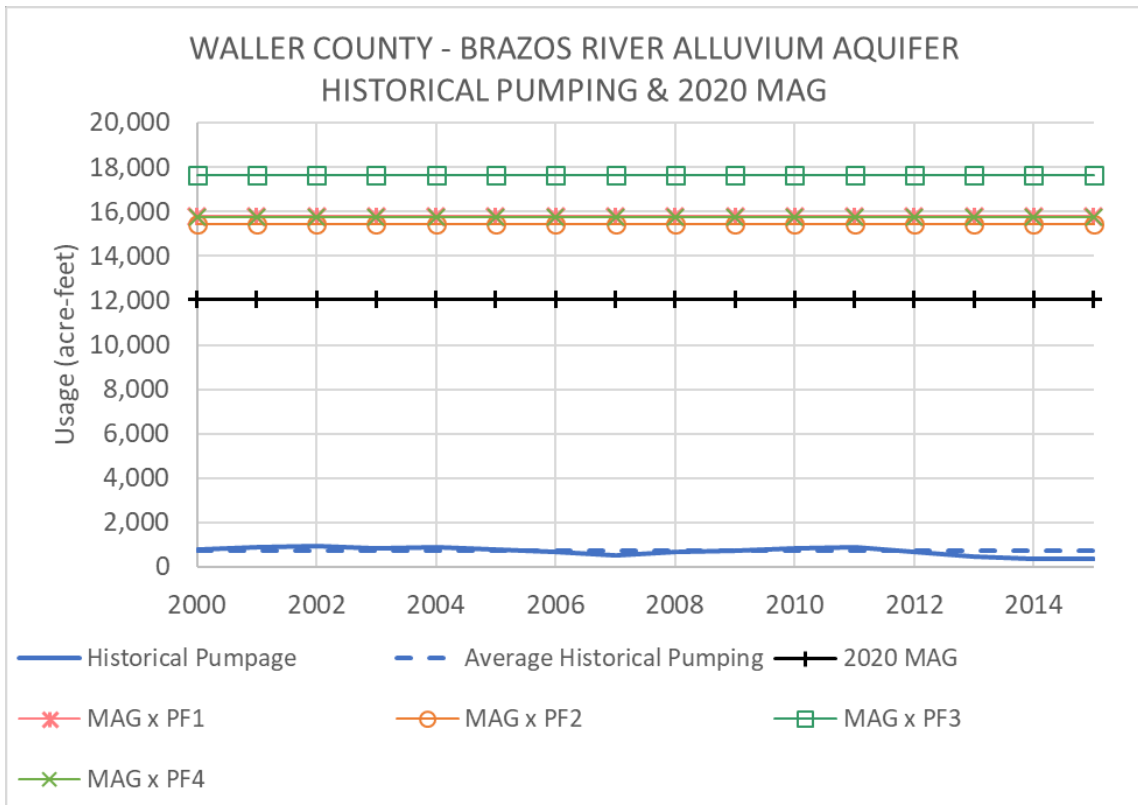
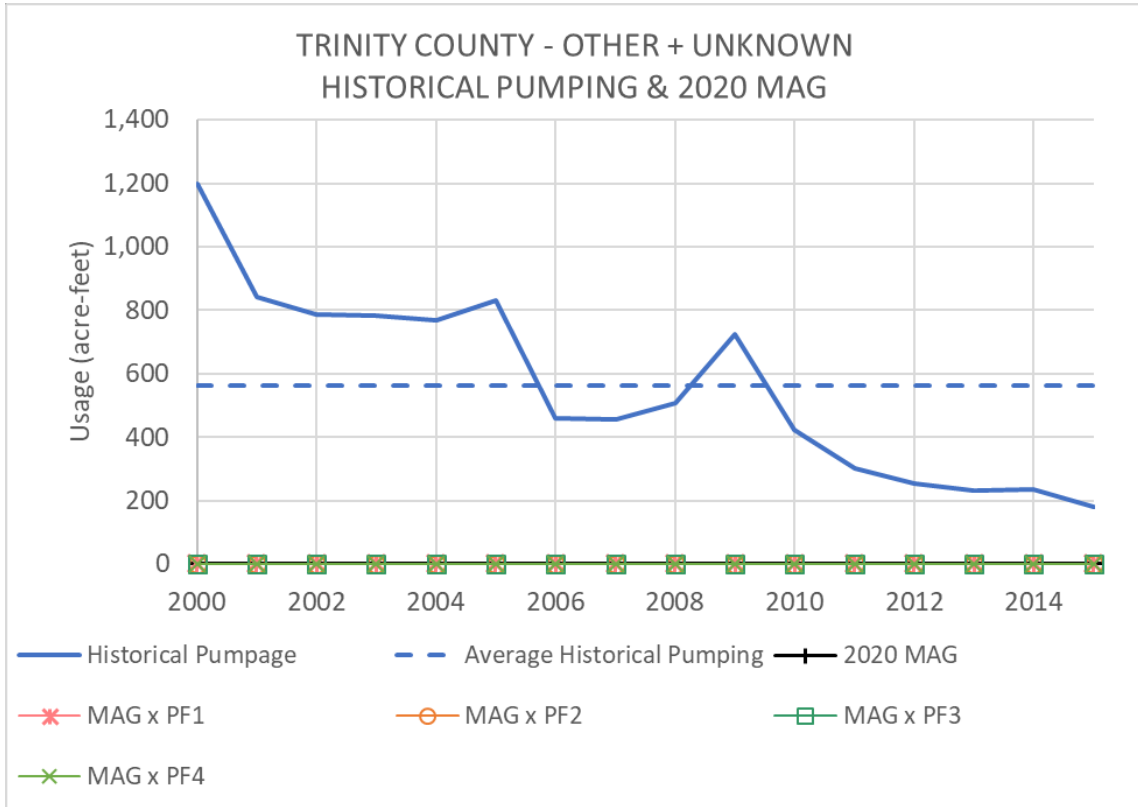
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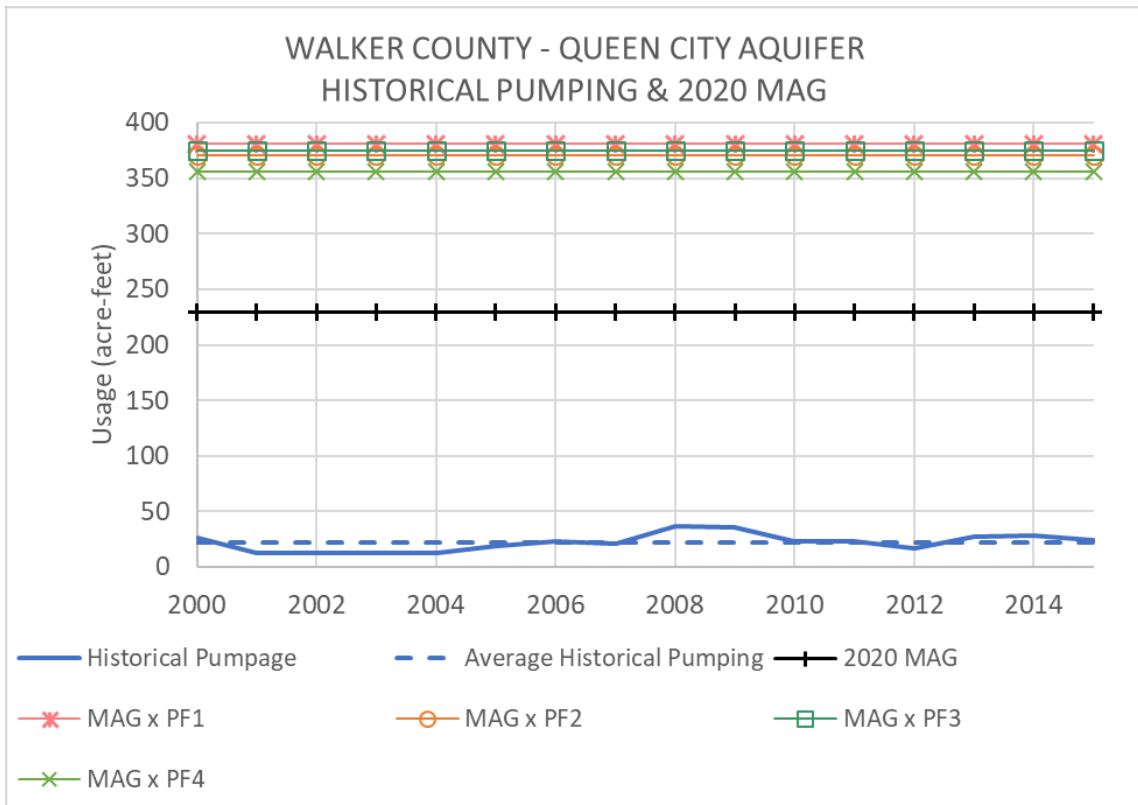
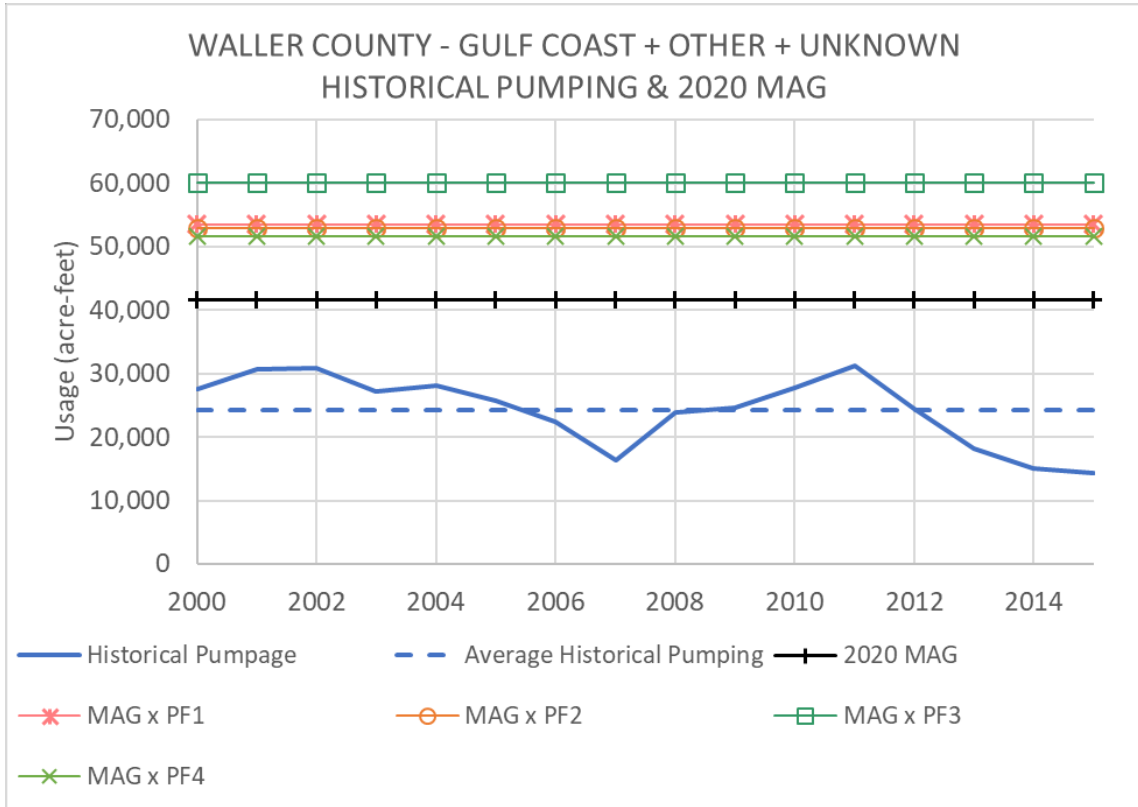
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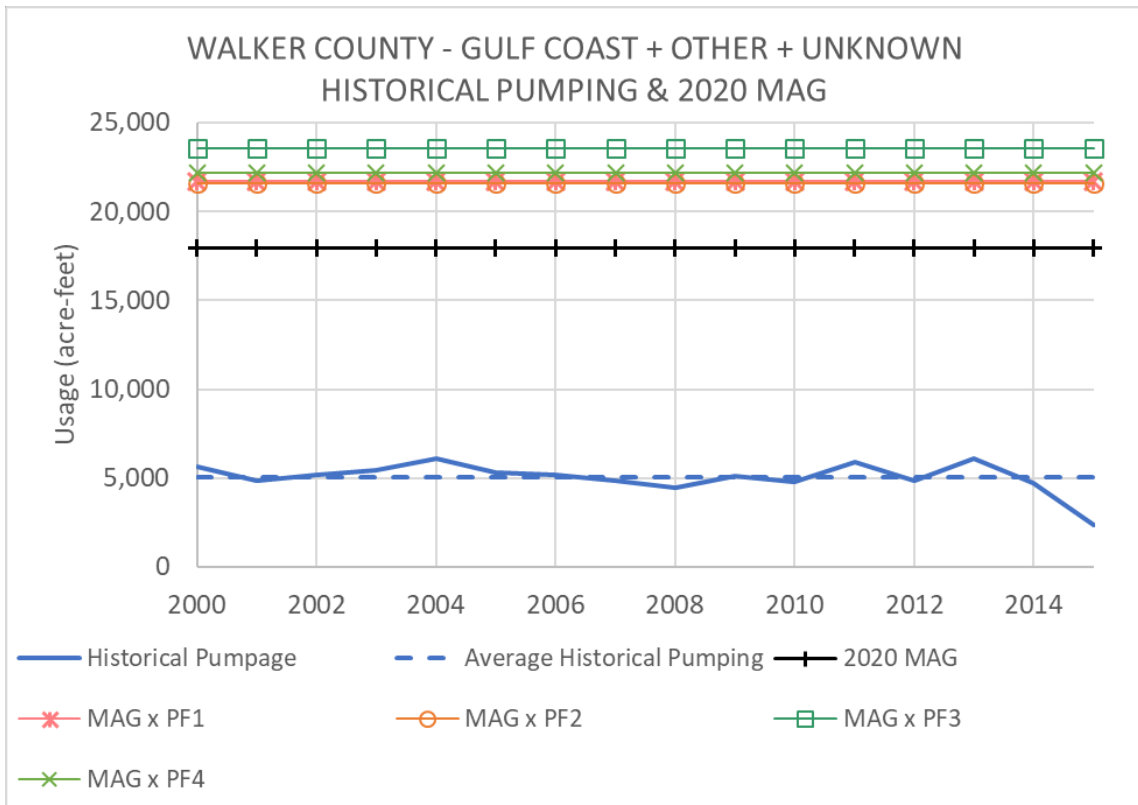
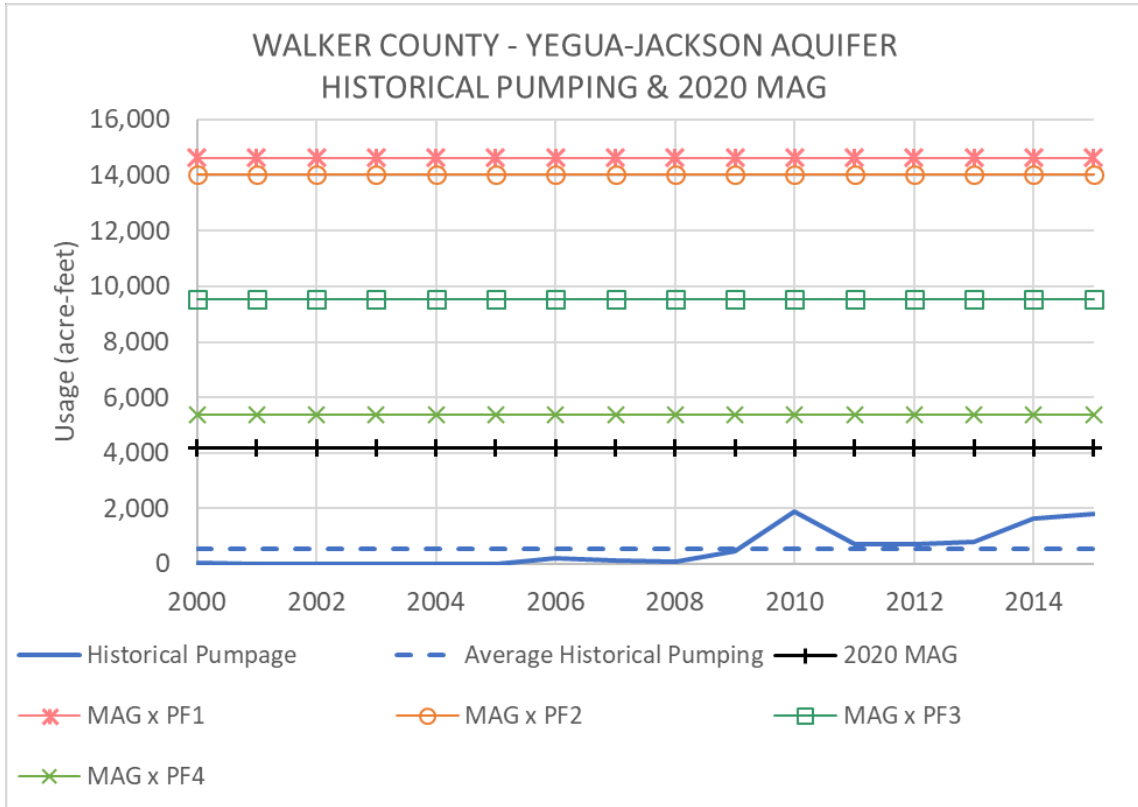
2021 Region H RWP  
 Potential MAG Peak Factor Methodology



2021 Region H RWP  
 Potential MAG Peak Factor Methodology



2021 Region H RWP  
 Potential MAG Peak Factor Methodology





## Agenda Item 10

Receive report from Consultant Team and Water Management Strategy (WMS) Committee regarding WMS analyses and consider taking action to approve the notice-to-proceed request and authorizing the Consultant Team and San Jacinto River Authority to submit the request to TWDB, coordinate with TWDB as needed on follow-up information, and execute the subsequent contract amendment issued.



## Agenda Item 10 WMS Analyses

- WMS analyses funded under Phase 2
- \$948,695 for Region H
- Additional steps for release
  - Scope and fee request
  - TWDB approval
- Can make multiple requests
  - Better assess RWP focus
  - Inter-task flexibility
- TWDB form now available



## Agenda Item 10 WMS Analyses



### Development of WMS Planning Database

#### Scope and Budget

- Tool for allocation of volumes and costs
- Coordinate with TWDB to align with DB22 structure
- Budget of \$49,600

#### Key Considerations

- Overlaps all WMS studies
- Efficiency
- Stability
- Support of reports and requests

## Agenda Item 10 WMS Analyses



### Update and Reallocation of Strategies to WUGs

#### Scope and Budget

- Evaluate based on studies/matrix
- Process documentation
- Strategy allocations
- Database efforts
- Develop RWP Chapter
- Budget of \$72,000

#### Key Considerations

- Overlaps all WMS studies
- Key to plan development

## Agenda Item 10 WMS Analyses



### Comprehensive Cost Updates

#### Scope and Budget

- Revisit cost updates for all projects
- Adjust for inflation
- Identify opportunities to more thoroughly assign costs for under-documented components
- Budget of \$113,700

#### Key Considerations

- Any WUG or sponsor with WMS not studied separately
- Enhanced project definition

## Agenda Item 10 WMS Analyses



### Contractual Transfers

#### Scope and Budget

- Consider WMS to allocate available supplies
- Consider new supplies and recursive water related to intermediary infrastructure
- Develop summary memorandum
- Budget of \$44,800

#### Key Considerations

- Any WMS contingent on contracts
- Crucial component of regional supply

## Agenda Item 10 WMS Analyses



### Expanded Use of Groundwater

#### Scope and Budget

- Regulating agency coordination
- Identify users and compare against remaining availability
- Allocate within regulatory limits
- Update yield, cost, etc.
- Budget of \$27,200

#### Key Considerations

- Major supply
- Considered early in allocation process
- Ties in to ongoing groundwater process

## Agenda Item 10 WMS Analyses



### Groundwater Reduction Plans

#### Scope and Budget

- Project sponsor coordination
- Update technical details
- Update yield, cost, etc.
- Budget of \$49,600

#### Key Considerations

- Major components
- Driver of large number of projects
- Ties in to ongoing groundwater process

## Agenda Item 10 WMS Analyses



### Aquifer Storage and Recovery

#### Scope and Budget

- Identify viable locations, rates, source water, sponsors, etc.
- Identify subsidence impacts and water quality
- Consider treatment and other infrastructure and cost
- Budget of \$78,500

#### Key Considerations

- Innovative approach
- Ability to leverage other sources to increase reliability
- Database structure accommodates ASR

## Agenda Item 10 WMS Analyses



### Municipal Conservation

#### Scope and Budget

- Review prior RWP, TWDB data, new WCPs, Goldwater, etc.
- Determine estimates for conservation and loss reduction
- Coordinate on specific WUG projects
- Update yield, cost, etc.
- Budget of \$42,200

#### Key Considerations

- Long-standing Region H WMS
- Key strategy in Region H methodology
- Applicable to large number of WUGs

## Agenda Item 10 WMS Analyses



### Irrigation Conservation

#### Scope and Budget

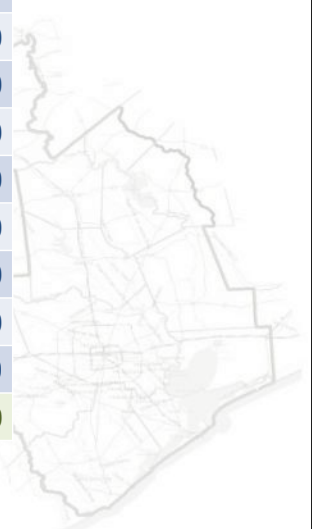
- Review documentation from 2016 RWP
- Update acreage and crops as appropriate
- Update yield, cost, etc.
- Budget of \$4,600

#### Key Considerations

- Long-standing Region H WMS
- One of the limited options for Irrigation WUGs

## Agenda Item 10 WMS Analyses

Task	Cost
Development of WMS Planning Database	\$49,600
Update and Reallocation of Strategies to WUGs	\$72,000
Comprehensive Cost Updates	\$113,700
Contractual Transfers	\$44,800
Expanded Use of Groundwater	\$27,200
Groundwater Reduction Plans	\$49,600
Aquifer Storage and Recovery	\$78,500
Municipal Conservation	\$42,200
Irrigation Conservation	\$4,600
<b>TOTAL</b>	<b>\$482,200</b>



## Agenda Item 10 WMS Analyses

### Action:

Approve the notice-to-proceed request and authorize the Consultant Team and San Jacinto River Authority to:

1. Submit the request to TWDB.
2. Coordinate with TWDB as needed on follow-up information.
3. Execute the subsequent contract amendment issued.





April 4, 2018

**Agricultural**

Robert Bruner  
Pudge Willcox,  
Executive Committee

**Counties**

John Blount  
Judge Mark Evans, Chair  
Judge Art Henson

**Electric Generating Utilities**

Vacant

**Environmental**

John R. Bartos,  
Executive Committee

**Groundwater Management Areas**

David Bailey  
Kathy Jones

**Industries**

James Comin  
Glenn Lord

**Municipalities**

Yvonne Forrest  
Robert Istre

**Public**

Carl Masterson

**River Authorities**

David Collinsworth  
Jace Houston, Secretary  
Kevin Ward

**Small Businesses**

Judge Bob Hebert  
Ruth Stultz  
Vacant

**Water Districts**

Marvin Marcell  
Mike Turco  
Jimmie Schindewolf

**Water Utilities**

Ivan Langford  
James Morrison  
William Teer

Lann Bookout  
Executive Administrator  
Texas Water Development Board  
1700 North Congress Av.  
Austin, Texas 78701

**Re:** Region H Request for Task 5A Notice-to-Proceed

Dear Mr. Bookout:

The Region H Water Planning Group (RHWPG) took public comment on and adopted a process for identifying and evaluating Water Management Strategies (WMS) at a public meeting on December 6, 2017. The RHWPG, in conjunction with the Region H WMS Committee, has subsequently considered the efforts anticipated to be necessary for WMS analysis and has initiated the Task 5A scope development process. Nine subtasks have been identified for which the RHWPG wishes to request written notice-to-proceed from TWDB; in accordance with Texas Water Development Board (TWDB) guidance, more information on these subtasks is included in the attached budget request form. Approval for submittal of this request was granted at the April 4, 2018 meeting of the RHWPG.

The identified subtasks were primarily selected due to applicability to and facilitation of a wide range of other anticipated Task 5A analyses. The proposed groundwater studies are also closely related to the evaluation of existing supplies due to the nature of groundwater regulation and ongoing source conversion initiatives in Region H. For these reasons, the RHWPG feels it appropriate to request notice-to-proceed prior to completion of the analysis of projected water needs.

Please feel free to contact myself or Philip Taucer of Freese and Nichols at 713-600-6835 with any questions regarding this request.

Sincerely,

Mark Evans  
Chair, Region H Water Planning Group



**SUGGESTED SCOPING TEMPLATE FOR CURRENTLY CONTRACTED TASK 5A FUNDING FOR REGION-SPECIFIC SUBTASKS**

Strategy Type(s)	ASR	Conservation/Drought Management	Groundwater Desal	Groundwater Dvlp	Reuse	New Major Reservoir	Other Surface Water	Seawater Desal	Conjunctive Use	Other WMS (Subordination, etc)	Region	Overall TWDB Task Number	SubTask WMS evaluation number	SubTask WMS	SubTask Scope of Work Write-up	Deliverable	SubTask Budget (\$)	WUG(s) &/OR WWP Entities Potentially Served by WMS(s)	Addressing a changed condition from previous cycle? If yes, describe the changed condition.	When was this WMS identified by RWPG as potentially feasible?	Was the WMS evaluated in any previous Regional Water Planning Cycles?	Is evaluation a limited update to previous technical information? If no, indicate specific update in subtask sow column E
										X	H	5A	01.0	Development of WMS Planning Database	Prepare a planning tool for allocation of WMS volumes and costs to enhance project allocation. Coordinate with TWDB regarding structure and functionality of DB22 in order to mirror statewide process for project and WMS tracking.	Inputs to DB22 for all WMS and projects.	\$ 49,600	Multiple	No	N/A	N/A	N/A
										X	H	5A	02.0	Update and Reallocation of Strategies to WUGs	Evaluate potential water management strategies based on technical evaluations and selection criteria matrix and develop documentation of selection process. Allocate selected WMS to WUGs with needs. Update RWP document and incorporate strategy allocations into DB22. Develop Chapter 5 document, incorporating modifications from public, RWPG, and agency comments.	Chapter 5 of the Regional Water Plan document and corresponding data submittal through the DB22 interface.	\$ 72,000	All with projected needs	Yes - based on updated needs assessment and recommended WMS	N/A	No	No
										X	H	5A	03.0	Comprehensive Cost Updates	Revisit cost updates for all projects and apply proper cost adjustments for inflation. Also investigate projects to identify opportunities to more thoroughly assign costs for under-documented project components in previous RWPGs.	Updated technical memoranda for all projects not studied under specific, detailed analyses.	\$ 113,700	Any WUG or WWP with a WMS not studied in detail under separate funding	Yes - Updates for inflation and enhanced project definition	Yes - All planning cycles	Yes	
										X	H	5A	04.0	Contractual Transfers	Examine WMS to identify which require contractual agreements and determine volumes associated with these agreements. Review will include both new supplies and recursive strategies such as transmission infrastructure WMS. Summarize recommended contractual relationships by entity and supply source.	Technical memorandum describing strategy and summarizing the contractual volumes and associated entities necessary to facilitate implementation of other WMS.	\$ 44,800	Any with WMS contingent on a contract	Yes - Potential for different contractual needs based on other WMS	Yes - 1st, 2nd, 3rd, and 4th planning cycles	No	
											H	5A	05.1	Expanded Use of Groundwater	Coordinate with the groundwater regulating agencies regarding the status and results of the ongoing groundwater availability rules. Identify WUGs or groups of WUGs currently utilizing groundwater sources. Compare against remaining volumes of modeled available groundwater after allocation of existing groundwater supplies. Allocate remaining modeled available groundwater to WUGs with needs within the limits of groundwater reduction plans and subsidence and conservation district rules. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	\$ 27,200	WUGs in counties with projected needs and unallocated groundwater supplies	Yes - Ongoing groundwater rule making	Yes - 2nd, 3rd, and 4th planning cycles	No	
										X	H	5A	05.2	Groundwater Reduction Plans	Coordinate with project sponsors regarding the status of their projects. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memoranda describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	\$ 49,600	Multiple WUGs and WWPs in Fort Bend, Galveston, Harris, and Montgomery Counties	Yes - Partial implementation and updates to a number of GRPs	Yes - 4th planning cycle	No	
	X										H	5A	05.3	Aquifer Storage and Recovery	Identify aquifers and locations with potential to receive and store treated source water and amount storable and retrievable. Identify required rates, other characteristics, impacts to subsidence and physical and technical limitations. Identify potential available production capacity and infrastructure for potential sponsors. Investigate source and recipient water quality and consider treatment needs and methods to avoid or manage comingling. Summarize project cost and legal and regulatory considerations. Coordinate as applicable with local, state, and federal agencies.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	\$ 78,500	Multiple	No	Yes - 4th planning cycle	No	

**SUGGESTED SCOPING TEMPLATE FOR CURRENTLY CONTRACTED TASK 5A FUNDING FOR  
REGION-SPECIFIC SUBTASKS**

Strategy Type(s)	Region-Specific Subtasks																					
	ASR	Conservation/Drought	Management	Groundwater Desal	Groundwater Dvlp	Reuse	New Major Reservoir	Other Surface Water	Seawater Desal	Conjunctive Use	Other WMS (Subordination, etc)	Region	Overall TWDB Task Number	SubTask WMS evaluation number	SubTask WMS	SubTask Scope of Work Write-up	Deliverable	SubTask Budget (\$)	WUG(s) &/OR WWP Entities Potentially Served by WMS(s)	Addressing a changed condition from previous cycle? If yes, describe the changed condition.	When was this WMS identified by RWP as potentially feasible?	Was the WMS evaluated in any previous Regional Water Planning Cycles?
	X										H	5A	06.1	Municipal Conservation	Review WUG survey responses, water conservation plans, TWDB outdoor water use data, the Goldwater Project, TWDB Water Loss Audit, and other available data to determine estimated achievable municipal conservation and water loss reduction levels based on WUG size or other key characteristics. Coordinate with municipal WUGs regarding conservation volumes and practices and incorporate any data received into strategy documentation and allocations.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	\$ 42,200	Municipal WUGS	No	Was a recommended WMS in 2001, 2006, 2011, and 2016 Regional Water Plans	Yes - 1st, 2nd, 3rd, and 4th planning cycles	No
	X										H	5A	06.2	Irrigation Conservation	Review technical documentation from the 2016 RWP and available crop acreage data and update calculations as appropriate to reflect changes in irrigation water demand projections. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	\$ 4,600	Irrigation WUGS	No	Was a recommended WMS in 2001, 2006, 2011, and 2016 Regional Water Plans	Yes - 1st, 2nd, 3rd, and 4th planning cycles	Yes
<b>REGION-SPECIFIC SUBTASKS TOTAL BUDGET</b>																	<b>\$ 482,200</b>					

**Fifth Cycle of Regional Water Planning**  
**OBTAINING A WRITTEN NOTICE-TO-PROCEED TO EXPEND TASK 5A FUNDS**

The regional water planning contract budgets include the total funding amount allocated for Task 5A (Evaluation and Recommendation of Water Management Strategies (WMSs) and associated WMS Projects (WMSPs)) but do not include the scope of work (SOW) subtasks for region-specific WMS evaluations. When a regional water planning group (RWPG) wishes to proceed on **any** subtask associated with Task 5A, they must submit an adequate subtask SOW for the Task 5A budget allocated to the region. This is required for the region to obtain a written notice-to-proceed from the TWDB that releases the Task 5A funds for expenditure. Task 5A is the only regional water planning contract SOW item that requires a notice-to-proceed.

RWPGs should, in general, develop the proposed SOW for potential WMS evaluations after identifying needs. As noted in the current contract SOW, the work effort associated with preparing and submitting a proposed region-specific Task 5A SOW for the purposes of obtaining a written notice-to-proceed from the TWDB is not included in Task 5A and is not reimbursable under the contract.

The process to obtain a written notice-to-proceed is as follows:

1. The RWPGs prepare a proposed SOW associated with the Task 5A budget amount, using the attached excel template. The proposed SOW (and supporting materials) and submission of the notice-to-proceed request to the TWDB must be an action item for approval from the RWPG at a regularly-scheduled public meeting and **with an opportunity for public input** (e.g. at the RWPG meeting where they approve the submittal).
2. The action item(s) should include language to address
  - a) approval and authorization to submit the approved notice-to-proceed request to the TWDB,
  - b) authorization for the consultant and/or political subdivision to work with the TWDB on any follow up information that might be required, and
  - c) authorization for the political subdivision to negotiate and execute the subsequent TWDB contract amendment that will be issued.
3. RWPGs should use the Task 5A subtask scope and budget request excel template provided, which must include enough basic information to allow the TWDB to adequately review the proposed subtask SOW, ensure the associated subtask budget is fully justified, and ensure that all the identified work is eligible under the TWDB's rules and contract. The associated WMSs must have been identified as "potentially feasible" prior to including them in a notice-to-proceed request.
4. The subtask and budget breakdown shall be presented in logical increments that allow the political subdivisions, RWPG members, and the TWDB to evaluate the proposed SOW and associated work effort. Submissions should not include grouping/aggregations that make it unnecessarily difficult for political subdivisions, RWPG members, or the TWDB to judge the amount of associated work, deliverables, or eligibility. Items a-g below provide some general guidance on acceptable levels of aggregation in the proposed SOW:
  - a) WMS groupings for certain types of WMSs may be acceptable for scoping purposes; for example, "Local Groundwater Development." This grouping could represent multiple,

smaller, WMSs for multiple water user groups (WUGs), where the WMSs are of a similar scale for each individual WUG. The individual WUGs would need to be identified in the SOW request.

- b) Multiple WMS evaluations of a larger scale and more complex configuration should not be aggregated into a single line item for scoping purposes, for example, an entity's new water supply Capital Improvement Plan for the next 50 years should not be aggregated into a singular WMS, especially if it includes multiple types of strategies.
  - c) To assist in determining which WMSs are grouped or scoped individually, the RWPG may wish to set a volumetric threshold, for example, WMSs that provide more than 5,000 acre-feet/year would be scoped individually. The definition of an appropriate threshold would be based on the discretion of the RWPG and may be relative to the size of the budget.
  - d) New major water supply development strategies, for example, major reservoirs or major well field development, must be scoped individually.
  - e) WMS evaluations may be aggregated at the WMS type level, as appropriate, however multiple WMS types should not be aggregated. This means, for example, that scoping for reuse WMSs should not be aggregated with conservation WMS evaluations, or groundwater development WMS evaluations.
  - f) WMS Projects (WMSPs) are not expected to be scoped, but if known, they may be discussed in the associated WMS "Scope of Work Write-Up" or "Deliverable" columns of the spreadsheet template, as appropriate.
  - g) For evaluations limited to updating costs of previously recommended or alternative WMSs and associated WMSPs, it is acceptable to aggregate this work by WMS type.
5. The notice-to-proceed submittal to the TWDB must also include the date on which the RWPG presented its overall methodology for identifying potentially feasible WMSs to the public for comment **and** the date on which the RWPG approved the methodology. The process for identifying potentially feasible WMSs must be approved prior to the RWPG taking action on a notice-to-proceed request.
  6. RWPGs' shall submit the formal notice-to-proceed request to their TWDB Project Manager. If the notice-to-proceed request is submitted prior to the RWPG's identification of water needs, the RWPG must also provide an explanation of why the RWPG finds it necessary to start on the associated WMS evaluation(s) before the region's water needs have been identified.
  7. TWDB staff will evaluate the notice-to-proceed request, justifications, proposed subtask SOW and budget and, if necessary, request additional information and negotiate with the RWPG to approve a final Task 5A SOW to go with the proposed subtask budget.
  8. If the notice-to-proceed request is approved by the TWDB, the TWDB will develop a contract amendment to add the new SOW subtasks under Task 5A and issue a notice-to-proceed letter. This is processed as a regular contract amendment that will require signature by the TWDB's Executive Administrator and the RWPG's political subdivision. Please note that:
    - a) RWPGs have the flexibility to submit multiple requests for a notice-to-proceed since they may want to begin evaluating some WMSs even though all of the region's needs may not be known for some time.
    - b) Each notice-to-proceed request requires RWPG approval at a public meeting with opportunity for public input.

March 12, 2018

- c) RWPGs may wish to leave some of the allocated Task 5A funds out of the proposed subtask SOW budget in order to address potential last-minute changes identified in the planning process, for example, if an entity requests a new WMS to be evaluated late in the cycle.
  - d) In past cycles, some RWPGs have developed a small subtask SOW for “Other WMSs” in order to address cases where entities are considering optional WMSs, but detailed information is not yet known at the time of scoping. In these cases, it would be preferable for the RWPG to scope these subtasks at a later time. If a subtask SOW for “Other WMSs” is approved by the TWDB, the RWPG consultant should brief the RWPG on the proposed work once the details are known, receive approval from the RWPG to perform the evaluation, and report on the scope to be performed to the TWDB in the form of a detailed progress report (this process will not result in an additional SOW amendment). If an “Other WMSs” subtask is proposed, the associated budget should be no more than 10 percent of the total budget allocated to Task 5A, and include a justification as to why such a subtask is necessary at this point plan development.
9. RWPG consultants should not perform work on **any** subtask associated with Task 5A prior to the RWPG taking action to approve the notice-to-proceed request. At the risk that the TWDB does not approve some portion of the proposed subtask SOW, RWPG consultants are permitted to start charging against Task 5A (including standard Task 5A subtasks and region-specific subtasks) from the date the RWPG approved the notice-to-proceed request.
10. The TWDB will not release funds for reimbursement associated with Task 5A until issuance of the written notice-to-proceed.





## Agenda Item 11

Consider and take action to authorize the San Jacinto River Authority to execute a contract amendment with TWDB for additional funding.



## **Agenda Item 11**

### **Contract Amendment**

#### **Action:**

Authorize the San Jacinto River Authority to execute a contract amendment with TWDB for additional funding.





## Agenda Item 12

Receive report from Consultant Team and WMS Committee regarding WMS allocation safety factors and consider taking action to designate a safety factor for use in development of the 2021 Region H Regional Water Plan.



## Agenda Item 12 Management Supply Factor

*WMS*  

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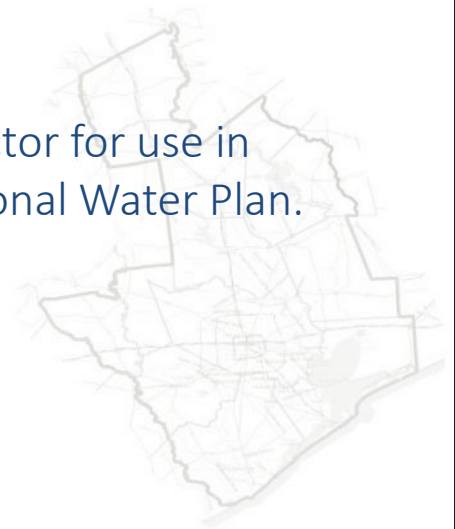
*Need*

- Declared Management Supply Factor goal
- RWPG must justify in Plan
- Otherwise, just calculate as normal
- Region H declined option in 2016 RWP
- WMS Committee suggests not assigning.
  - Already covered by many project designs
  - Potential for WMS without need

## Agenda Item 12 WMS Safety Factor

### **Action:**

Designate a WMS allocation safety factor for use in development of the 2021 Region H Regional Water Plan.







## Agenda Item 13

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



## **Agenda Item 13**

### **Community Outreach**

- Baytown Area Community  
Advisory Panel  
February 19





## Agenda Item 14

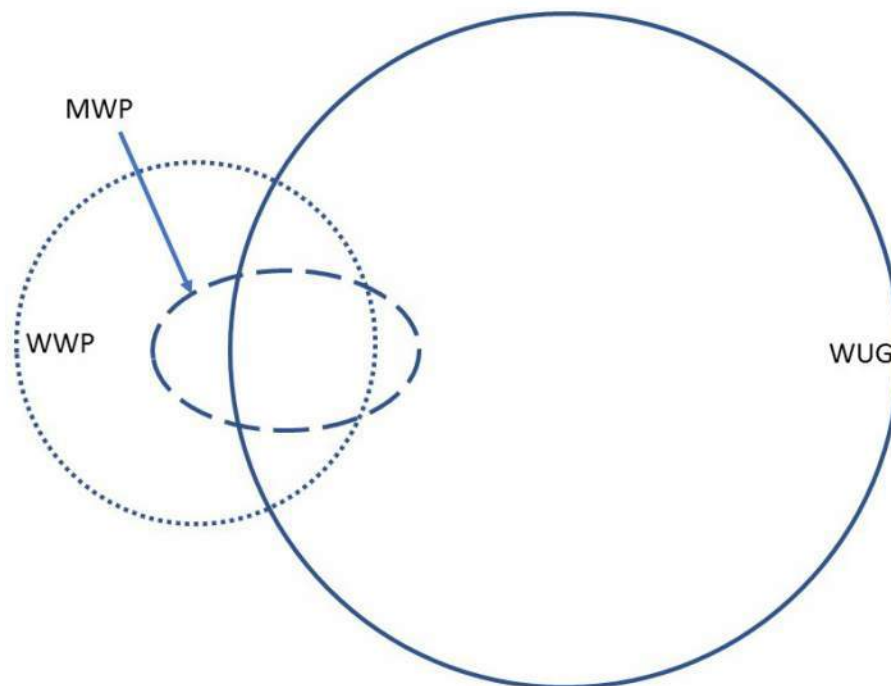
Agency communications and general information.



## Water User Groups, Wholesale Water Providers, and Major Water Providers in Regional Water Planning

Regional water planning groups (RWPG) are required by rule to specifically consider three, often overlapping, planning units, Water User Groups (WUG), Wholesale Water Providers (WWP), and Major Water Providers (MWP), when developing their plans. This document explains what these entities are, how they relate, and how they may overlap. Keep in mind throughout this discussion that a single entity may simultaneously be designated as a WUG, WWP, and MWP, as summarized in Figure 1. Note that an MWP must also be at least a WUG or a WWP.

**Figure 1:** Ven relationship between three categories of planning units in regional water plans



### **Water User Groups**

WUGs are the entities for which water demand projections are developed by the Texas Water Development Board (TWDB) and that form the underlying—and highest resolution—basis for each regional water plan and the state water plan. Water demands, existing water supplies, and water needs (or surpluses) are evaluated for all WUGs. The Texas state water plan focuses on addressing the identified water needs of the 2,900 WUGS within Texas that fall within six categories (municipal, irrigation, manufacturing, livestock, mining, and steam-electric power). The Texas state water plan presents all information, including information in the interactive state water plan, on a WUG-centric basis.

### **Wholesale Water Providers**

Another type of entity critical to plan development is the wholesale water provider, or WWP. For an entity to be designated as a WWP for planning purposes, it must sell or deliver (or plan to sell or deliver) wholesale water at some point in the 50-year planning horizon, as defined in 31 Texas Administrative Code (TAC) §357.10(43). If, for example, a WUG provides water to retail users as well as wholesale to other entities, it may also be considered a WWP (Figure 1). Regional water planning groups determine the WWPs that they want to utilize in their plan development based upon the known wholesale transactions that occur within the regional water planning area. Data analyses of identified WWPs occur in the evaluation of contractual obligations to supply water, the demands associated with WUGs served by the WWP, and the evaluation of the WWP's existing water supplies. Even though the RWPG is not required to specifically report basic information on WWP demands and supplies in the regional water plan,<sup>1</sup> it will need to do so in at least two specific instances, including:

- **if that same entity is also designated by the RWPG as a MWP, or**
- **if that WWP is designated as the “sponsor” of any recommended water management strategy project (WMSP) in the plan, through TWDB-generated data reports. The WWP information will provide the basis for the WWP WMSP or water management strategy.**

These are minimum reporting requirements; however, an RWPG may present more WWP information utilized in the development of its plan. **The extent to which RWPGs report on WWPs is left largely to the discretion of the RWPGs.**

### **Major Water Providers**

The new category of “Major Water Providers” was established in rules for the development of the 2022 State Water Plan in conjunction with the removal of certain reporting requirements<sup>2</sup> to allow RWPGs to establish a more static list of large water providers for which they report information and to provide regional water planning groups with more flexibility in deciding which large (relative to each region) water provider(s) they want to report information on in their regional water plans. Major water providers represent WWPs and/or WUGs that use, and/or are responsible for developing and/or delivering significant quantities of water in the region. It is up to each region to decide which entities are designated as MWPs.

The intent of the MWP category is to report data for entities of significance to the region.<sup>3</sup> If the region decides not to designate any entities as MWPs, the plan needs to include discussion in Chapter One as to why the RWPG determined it does not have any WUGs or WWPs of significance to the region's water supply.

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### **Definitions:**

*Water User Group (WUG) (31 TAC §357.10(42)) – Identified user or group of users for which water demands and existing water supplies have been identified and analyzed and plans developed to meet water needs. A*

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<sup>1</sup> Previously, TWDB administrative rules required that regional water planning groups report supply, demand, and water management strategy data for WWPs as well as describe those WWPs in Chapter One of their plans. However, this requirement was removed at the request of stakeholders including for the reason that the volumetric threshold previously applied to the WWP definition proved problematic in certain regional water planning areas due to fluctuations in reported use between planning cycles and due to the relative scale in both smaller and larger regional water planning areas.

<sup>2</sup> See footnote 1.

<sup>3</sup> Instead of reporting data for every WWP in the region, as was previously required per footnote 1.



FEBRUARY 2018

*municipal WUG is a utility-based entity as defined in 31 TAC §357.10(42). Rural municipal water use that falls outside of the service area of discrete municipal water provider boundaries is aggregated at the county level as “county-other.”*

*These include*

- A. privately-owned utilities that provide an average of more than 100 acre-feet per year (AFY) for municipal use for all owned water systems;*
- B. water systems serving institutions or facilities owned by the state or federal government that provide more than 100 AFY for municipal use;*
- C. all other Retail Public Utilities not covered in (A) or (B) above that provide more than 100 AFY for municipal use;*
- D. collective Reporting Units, or groups of Retail Public Utilities that have a common association and are requested for inclusion by the RWPG;*
- E. municipal and domestic water use, referred to as County-Other, not included in A–D above; and*
- F. non-municipal water use including manufacturing, irrigation, steam-electric power generation, mining, and livestock watering for each county or portion of a county in a regional water planning area.*

*Wholesale Water Provider (WWP) (31 TAC §357.10(43)) – Any person or entity, including river authorities and irrigation districts, that delivers or sells water wholesale (treated or raw) to WUGs or other WWPs or that the regional water planning group expects or recommends to deliver or sell water wholesale to WUGs or other WWPs during the period covered by the plan. The regional water planning groups shall identify the WWPs within each region to be evaluated for plan development.*

*Major Water Provider (MWP) (31 TAC §357.10(19)) – A WUG or WWP of particular significance to the region’s water supply as determined by the regional water planning group. This may include public or private entities that provide water for any water use category.*

For additional information on the regional water planning process and current activities, please call 512-936-2387 or visit [www.twdb.texas.gov/waterplanning/rwp/index.asp](http://www.twdb.texas.gov/waterplanning/rwp/index.asp).



**2021 Regional Water Plan Water Demand Projections:  
Summary of the Region H Regional Water Planning Group’s Official Revision Requests &  
TWDB Recommendations  
12/29/2017**

The Region H Regional Water Planning Group (Region H) submitted their official revision requests to the Texas Water Development Board (TWDB) on December 12, 2017. The TWDB reviewed the requests in accordance with criteria established in Section 2 of the *First Amended General Guidelines for Fifth Cycle of Regional Water Plan Development* (Exhibit C), which was updated by the TWDB in April 2017. This document summarizes the recommended population and water demand projections released as draft by the TWDB, the revisions requested by Region H, and the final demand projections recommended by the TWDB staff. All the water demand projections are displayed in acre-feet.

**1. Population & Municipal Water Demand Projections**

<b>Population</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
Draft	7,325,314	8,207,700	9,024,533	9,867,512	10,766,073	11,743,278
Requested Changes	7,325,314	8,207,700	9,024,533	9,867,512	10,766,073	11,743,278
Recommended	7,325,314	8,207,700	9,024,533	9,867,512	10,766,073	11,743,278

Region H did not request any changes to county or regional population totals but did request updates to the population for 29 Water User Groups (WUGs). Several WUG-level population projections were updated to reflect the current build-out population, which had already been reached or is close to being reached. The City of Sugar Land had annexed several small WUGs, and the region requested those individual WUG’s populations be added to Sugar Land. Subsequently, six WUGs in the TWDB draft projections are no longer recommended to be a WUG in the final projections (Greatwood CRU, Fort Bend County MUDs 111, 112, 67, 68, and 69). Region H also requested additional specific changes in WUG populations in seven counties (Brazoria, Fort Bend, Galveston, Harris, Leon, Montgomery, and Walker) and proposed that these changes be offset by corresponding changes to County-Other population. Region H expects a 0.97% compounded annual growth rate for 2020-2070. The TWDB staff recommends the region’s requested revisions to the population projections for the final projections.

<b>Municipal Demand</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
Draft	1,264,523	1,386,920	1,501,782	1,624,173	1,759,267	1,905,672
Requested Changes	1,265,235	1,388,614	1,503,295	1,625,548	1,760,536	1,906,920
Recommended	1,265,235	1,388,614	1,503,295	1,625,548	1,760,536	1,906,920

Region H requested updates to the GPCD and municipal demands for Sugar Land to account for the six WUGs that were annexed by the city. Additionally, the region requested to use the 2011 utility-based GPCD values that were provided by the TWDB in June 2017 for four WUGs (Harris County WCID 74, Flo Community WSC, MSEC Enterprises, and Phelps SUD) due to significant differences in utility boundaries and base population estimates used for the draft GPCDs. Fort Bend County MUD 187 did not start reporting to the Water Use Survey (WUS) until 2014, and the region requested to use 2015 GPCD data as it was more representative of a dry year than 2014. Overall the region’s requested changes to municipal demands resulted in a less than one percent increase from the TWDB draft municipal demand

projections. The TWDB staff recommends the region’s requested changes to municipal demands for the final projections.

## 2. Non-Municipal Water Demand Projections

### 2.1 Irrigation Demand Projections

Irrigation Demand	2020	2030	2040	2050	2060	2070
Draft	278,106	278,106	278,106	278,106	278,106	278,106
Requested Changes	342,862	342,862	342,862	342,862	342,862	342,862
Recommended	342,862	342,862	342,862	342,862	342,862	342,862

Region H requested to use the second highest year of water use between 2010 and 2015 as the baseline instead of using an average of the 2010-2014 estimates to ensure the demands are not biased by short-term limitations such as drought curtailments required by the wholesale provider or TCEQ curtailments during a priority call, which could artificially suppress demands. This methodology also prevents outliers in the estimates from being incorporated into the projections. The same methodology from the TWDB draft projections was then applied to hold the demands constant throughout the planning horizon. The request results in a 23 percent increase in irrigation demands for all decades. The TWDB staff recommends the region’s requested revisions to the irrigation water demand projections for the final projections.

### 2.2 Manufacturing Demand Projections

Manufacturing Demand	2020	2030	2040	2050	2060	2070
Draft	544,576	636,478	636,478	636,478	636,478	636,478
Requested Changes	594,455	694,635	694,635	694,635	694,635	694,635
Recommended	594,455	694,635	694,635	694,635	694,635	694,635

Region H requested updates to the methodology to select the highest water use estimate from 2010-2015 as the baseline for the projections, instead of the highest year between 2010-2014 utilized in the draft projections. The region also requested including unaccounted manufacturing water use estimates that were provided by the TWDB in June of 2017 to increase the baseline. This request results in changes to manufacturing water demands from the draft projections for eight counties (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller). For Galveston County, the region requested using historical data provided by the Gulf Coast Water Authority (GCWA) as a baseline instead of the TWDB’s WUS data. The GCWA sells water to the majority of the facilities within the county, and when comparing facility level data, the region believed the GCWA data to be more accurate. The region’s requested changes result in a seven percent increase in demands in 2020, and a nine percent increase in 2030-2070 compared to the draft projections. The TWDB staff recommends the region’s requested changes to manufacturing water demand projections for the final projections.

### 2.3 Steam-Electric Demand Projections

Steam-Electric Demand	2020	2030	2040	2050	2060	2070
Draft	112,355	112,355	112,355	112,355	112,355	112,355
Requested Changes	104,561	104,561	104,561	104,561	104,561	104,561
Recommended	104,561	104,561	104,561	104,561	104,561	104,561

Region H requested to modify the methodology to use the highest reported water use estimate between 2010-2015 at the facility level instead of the county level as the baseline. The updated methodology results in changes for two counties within the region (Harris and Montgomery). Additionally, demands were removed from three counties (Brazoria, Galveston, and San Jacinto) due to the plants within these counties being either cogeneration plants for manufacturing or air-cooled facilities that have no significant water demands. The requested changes result in a seven percent reduction in demands for all decades. The TWDB staff recommends the region’s requested steam-electric water demand projections for the final projections.

#### 2.4 Livestock Demand Projections

<b>Livestock Demand</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
Draft	14,164	14,164	14,164	14,164	14,164	14,164
Requested Changes	14,164	14,164	14,164	14,164	14,164	14,164
Recommended	14,164	14,164	14,164	14,164	14,164	14,164

Region H did not request any changes to the TWDB draft projections.

#### 2.5 Mining Demand Projections

<b>Mining Demand</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
Draft	15,486	16,267	15,426	14,646	13,938	13,657
Requested Changes	15,486	16,267	15,426	14,646	13,938	13,657
Recommended	15,486	16,267	15,426	14,646	13,938	13,657

Region H did not request any changes to the TWDB draft projections.

