

The logo for Region H Water Planning Group is a dark blue rectangle containing the text "REGION H" in large, bold, white, sans-serif capital letters. Below "REGION H" is the text "Water Planning Group" in a smaller, bold, white, sans-serif font.

**REGION H**  
**Water Planning Group**

**2021 Region H Initially Prepared  
Regional Water Plan  
Public Hearing Materials**

**April 23, 2020**



## 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
GPCD	Gallons Per Capita Per Day
GRP	Groundwater Reduction Plan
IPP	Initially Prepared Plan
MAG	Modeled Available Groundwater
MPC	Master Planned Community
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
UCM	Unified Costing Model
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 Public Hearing**  
**6:00 PM Thursday**  
**April 23, 2020**

**AGENDA**

1. Introductions on behalf of the Region H Water Planning Group.
2. Summary of the planning effort and the Initially Prepared Plan given by the Consultant Team.
3. Individual comments of members of the public.
4. Adjourn.

---

**HOW TO PARTICIPATE IN THE PUBLIC HEARING**

The Region H Water Planning Group will hold the public hearing via **webinar / telephone conference call**. Comments will be recorded and will be documented in the summary of public comments in the 2021 Region H Water Plan. All members of the public may participate in the meeting via webinar, Webinar App, or telephone conference call. Options for accessing the hearing are summarized below.

---

If you choose to participate via the webinar link below, you **WILL** have the opportunity to provide comments during the designated portion of the meeting.

**Webinar Link:** <https://attendee.gotowebinar.com/register/5389169788033358860>.

*After registering, you will receive a confirmation email containing information about joining the webinar.*

---

If you choose to participate via the **GoToWebinar App**, you **WILL** have the opportunity to provide comments during the designated portion of the meeting.

**Please use Webinar ID: 192-171-611.**

---

If you choose to participate in the hearing using the conference call number below, you will **NOT** have the opportunity to provide comments during the designated portion of the meeting. The conference call phone number is provided for **LISTENING PURPOSES ONLY**.

Telephone conference call phone number: **(415) 930-5321 and the audio access code is 612-139-300.**

---



# Presentation Slides





# REGION H

## Water Planning Group



### 2021 REGION H INITIALLY PREPARED REGIONAL WATER PLAN

Public Hearing

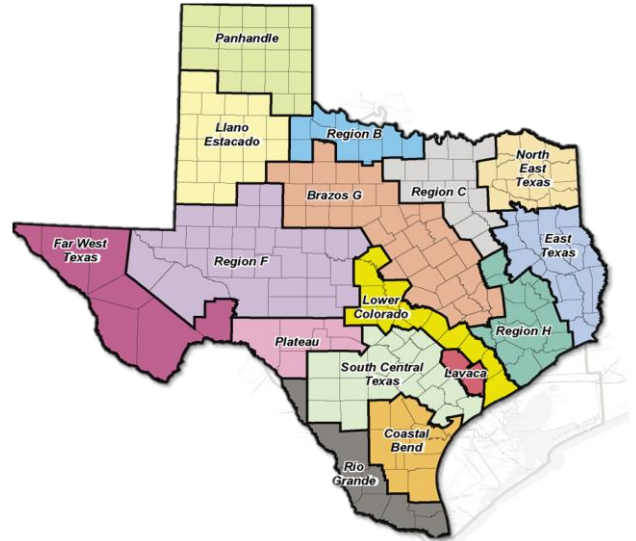
23 April 2020

## Water Planning in Texas



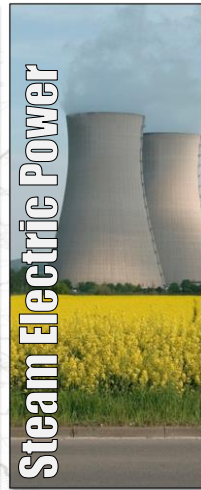
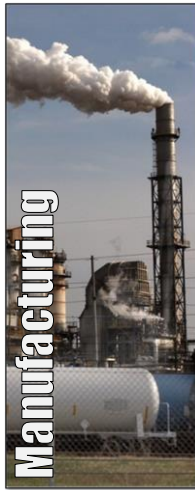
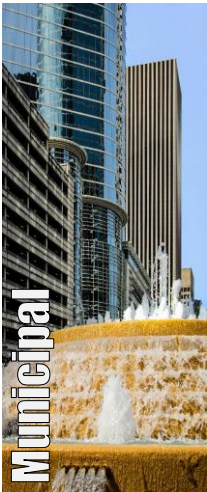
## Regional Water Plans

- 16 regions based on natural and political boundaries
- Volunteer planning groups of diverse interests
- Five-year cycle
- Compiled into State Water Plan



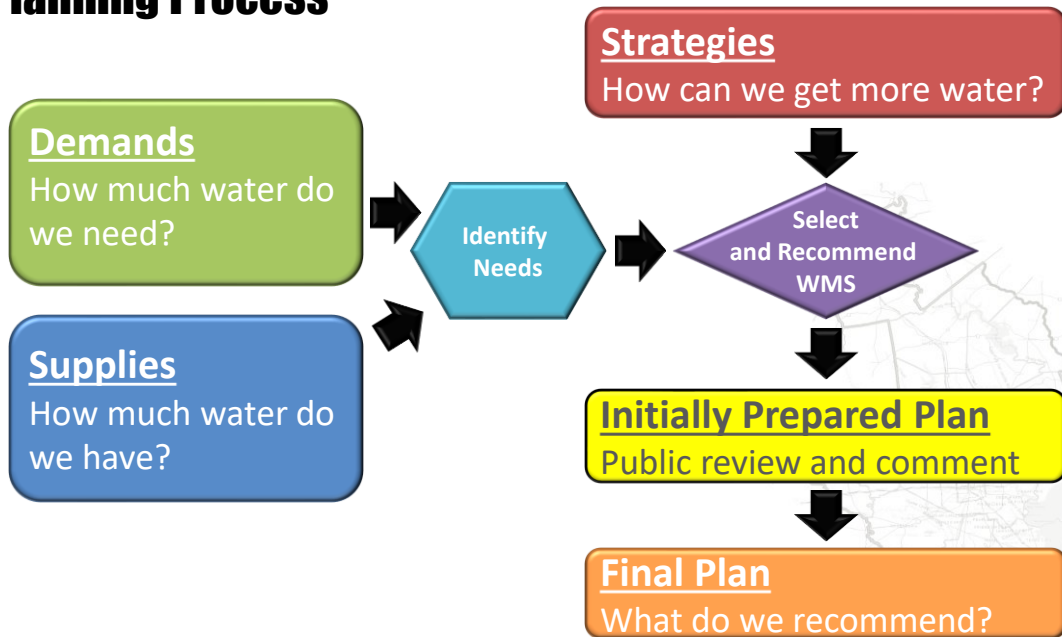
3

## The Planning Process



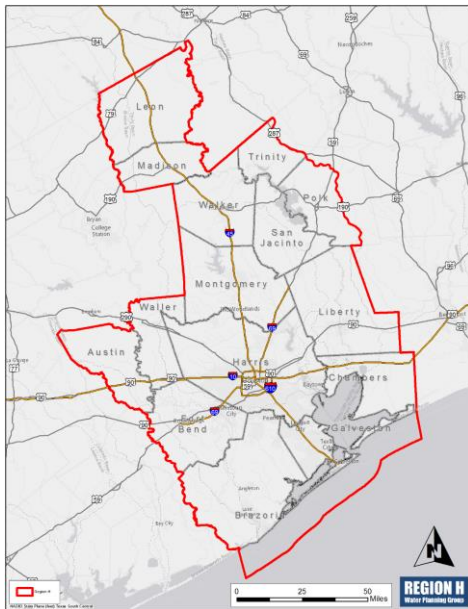
4

# The Planning Process



5

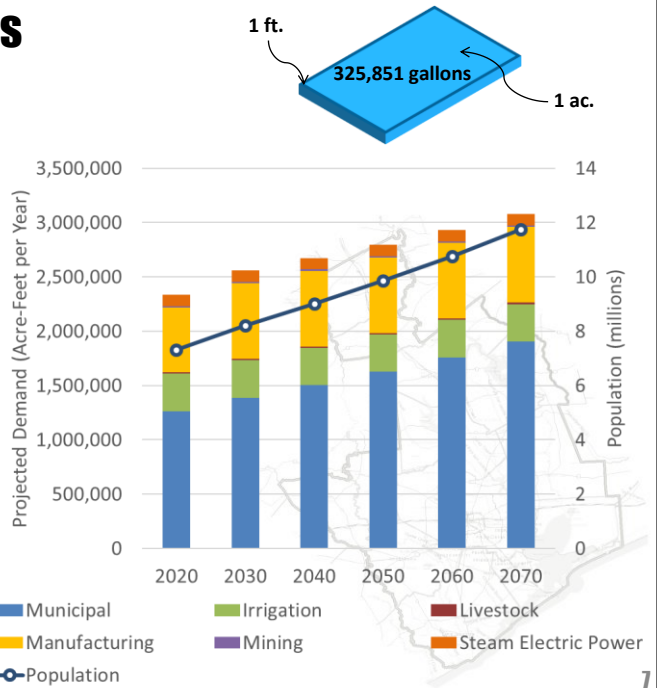
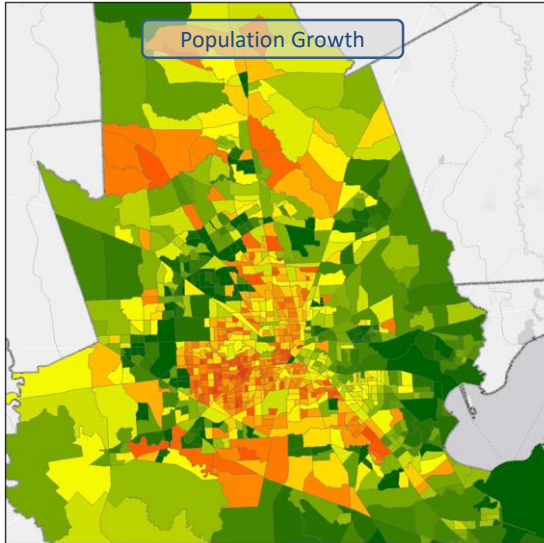
# About Region H



- Extends over 15 counties
- Two major and four minor aquifers
- Three river basins and three major reservoirs
- 26 Planning Group members

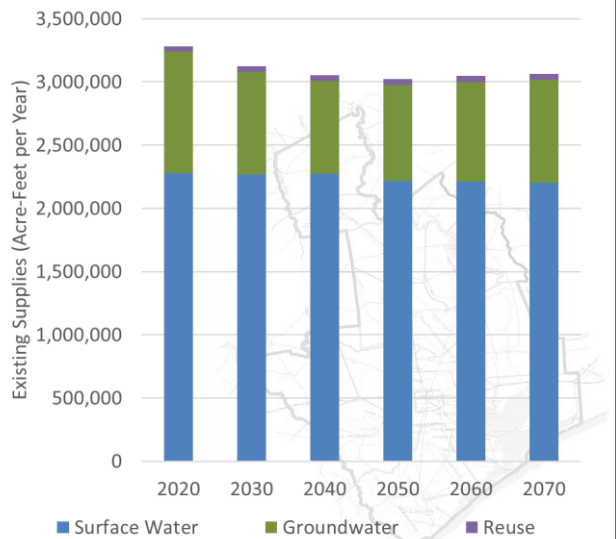
6

# Population and Water Demands

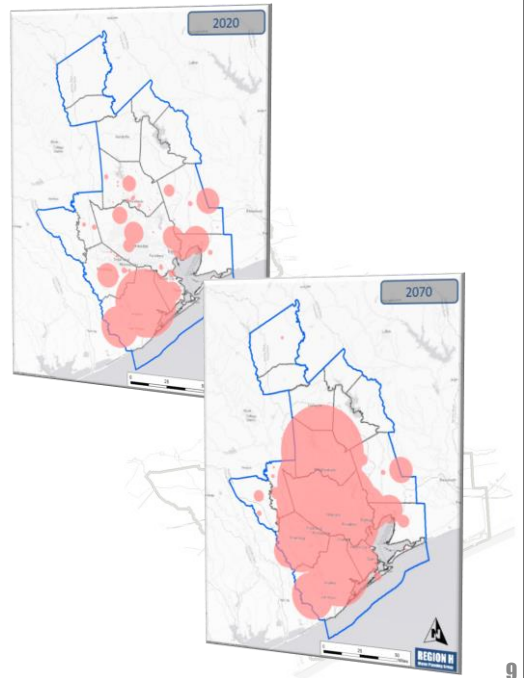
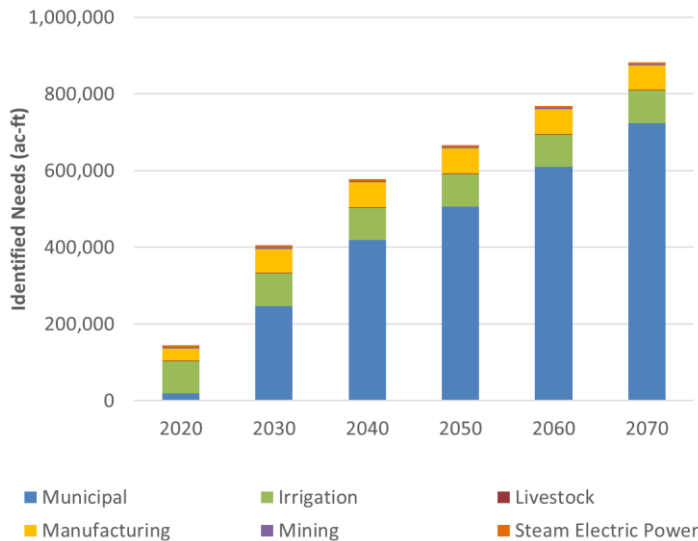


# Available Supplies

- Surface Water
  - Drought-of-record
  - TCEQ Water Availability Model
- Groundwater
  - Groundwater Management Area Process
  - GMAs 11, 12, and 14
- Reuse

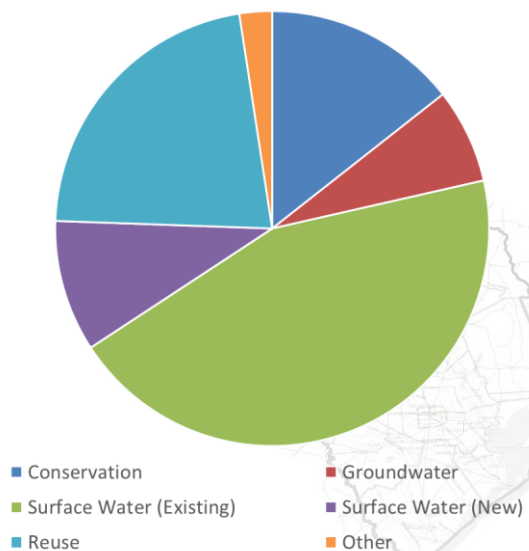


## Projected Needs (Shortages)



## Water Management Strategies and Projects

- 61 Water Management Strategies
  - Missouri City GRP
  - New/Expanded Contract with BRA
- 822 Projects
  - Allens Creek Reservoir
  - Northeast WPP Expansion





## Key Projects

### Conservation

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

### Reuse

- Direct
  - Municipal irrigation
  - Industry
- Indirect
  - City of Houston
  - San Jacinto Regional Return Flows



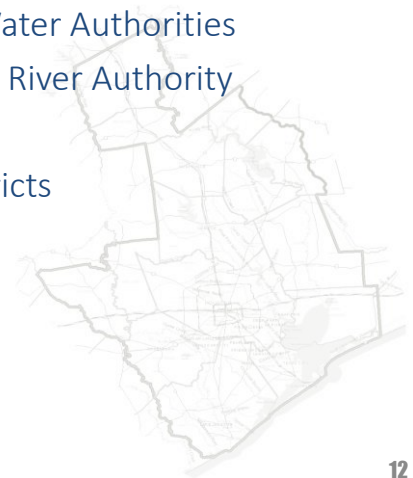
## Key Projects

### Groundwater Development

- Aquifer Storage and Recovery
- Brackish Groundwater Development
- Expanded Use of Groundwater
- Other groundwater projects

### Groundwater Reduction Plans

- Regional Water Authorities
- San Jacinto River Authority
- Cities
- Utility Districts



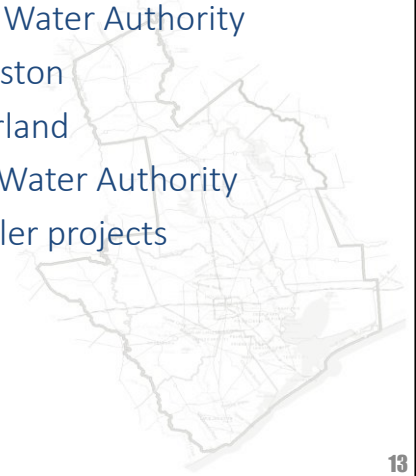
## Key Projects

### Conveyance

- GRP transmission and distribution
- Other major water authorities
- Interbasin transfers
  - East Texas
  - Livingston to SJRA
  - LNVA

### Treatment

- Brazosport Water Authority
- City of Houston
- City of Pearland
- Gulf Coast Water Authority
- Other smaller projects



13

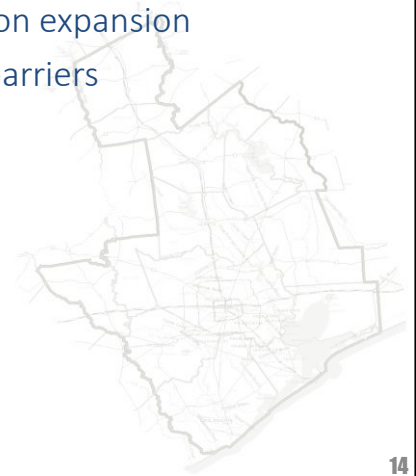
## Key Projects

### Surface Water

- Reservoir
  - Allens Creek
  - Dow
  - Storage expansions
- Desalination
  - Freeport
  - NRG Cedar Bayou

### Other

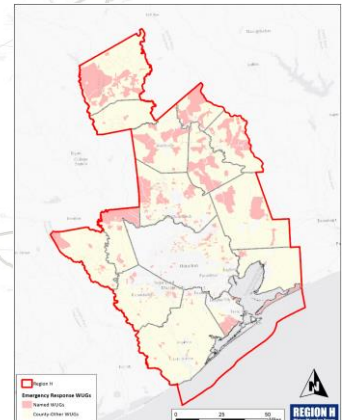
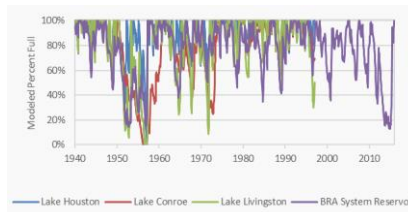
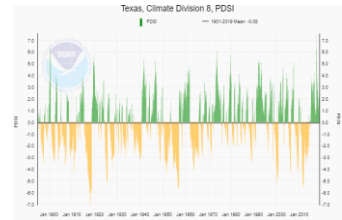
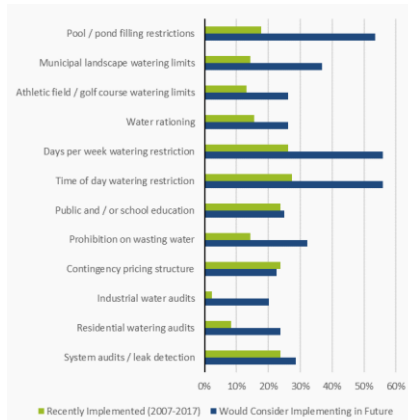
- Pump station expansion
- Saltwater barriers



14

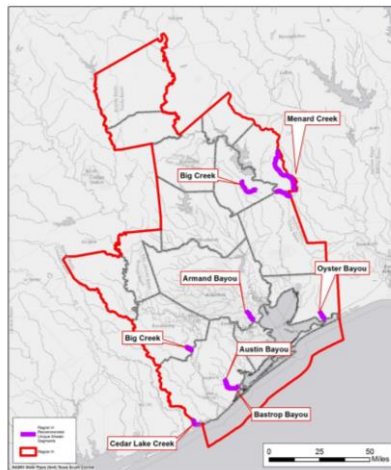
# Drought Response

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

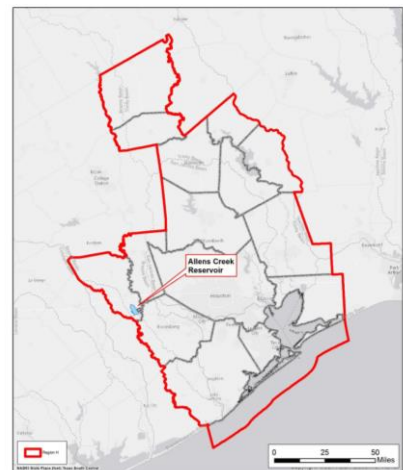


# Recommendations

- Unique Stream Segments
- Unique Reservoir Sites
- Other
  - Administrative
  - Legislative
  - Funding



Recommended Unique Stream Segments



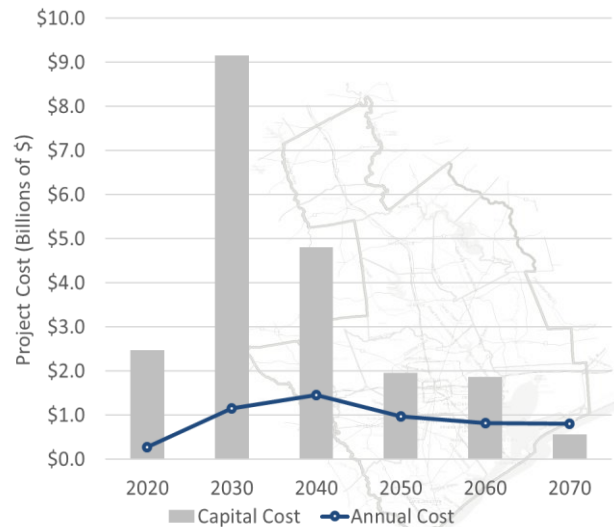
Recommended Unique Reservoir Sites





## Project Finance

- ≈ \$20.8 billion capital cost
- Infrastructure Finance Survey following IPP
- RWP criterion for some project financing mechanisms



17

## 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 Hearing process
- Deadline for Public Comments
  - 5:00 PM on June 28, 2020



18

## IPP Public Process

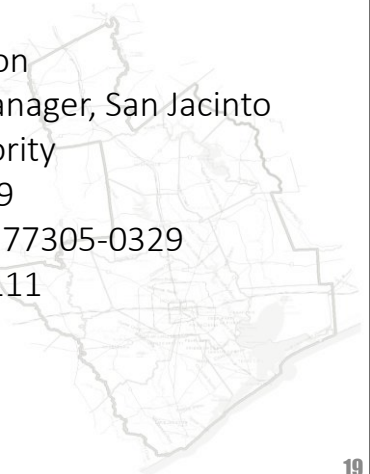
- To Submit Comments

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

- [info@regionhwater.org](mailto:info@regionhwater.org)

- Questions and Info Request

- Jace Houston  
General Manager, San Jacinto  
River Authority  
P.O. Box 329  
Conroe, TX 77305-0329  
936-588-3111



# Key Project Overview



## Region H Initially Prepared Plan Key Project Overview

Project	Potential Volume <sup>1</sup> (ac-ft)	Capital Cost (\$)	Unit Cost (\$/ac-ft)		Start Decade
			Start Decade	2070	
<b>Conservation</b>					
Irrigation Conservation	93,562	\$1,489,156	\$133	\$131	2020
Municipal Conservation (Advanced Conservation)	123,251	\$2,211,236,519	\$754	\$591	2020
Municipal Conservation (Water Loss Reduction)	62,601	\$891,822,048	\$625	\$578	2020
<b>Conveyance</b>					
BWA Transmission Expansions	26,211	\$77,755,692	\$248	\$39	2030
CHCRWA Transmission and Distribution Expansion	5,466	\$17,202,167	\$238	\$16	2030
City of Houston GRP Transmission	27,216	\$31,986,905	\$91	\$8	2040
COH, NHCRA, and CHCRWA Shared Transmission	154,575	\$462,453,409	\$246	\$27	2030
CWA Transmission Expansion	349,785	\$119,336,981	\$43	\$19	2040
East Texas Transfer	250,000	\$423,969,947	\$134	\$15	2050
GCWA Industrial Raw Water Line	33,600	\$20,909,636	\$63	\$19	2020
Lake Livingston to SJRA Transfer	50,000	\$245,492,975	\$437	\$92	2050
LNVA Neches-Trinity Basin Interconnect	67,000	\$103,316,000	\$135	\$27	2040
NFBWA Phase 2 Distribution Segments	62,496	\$83,859,522	\$104	\$9	2030
NHCRA Distribution Expansion	143,360	\$919,703,916	\$489	\$44	2030
NHCRA Transmission Lines	143,360	\$327,910,960	\$185	\$24	2030
Southeast Transmission Line Improvements	39,928	\$119,413,067	\$229	\$19	2030
Surfside Beach Supply Infrastructure	323	\$1,900,440	\$450	\$36	2020
WHCRA Distribution Expansion	92,288	\$276,977,822	\$237	\$26	2030
WHCRA/NFBWA Transmission Line	169,030	\$1,310,701,901	\$613	\$67	2030
<b>Groundwater Development</b>					
Aquifer Storage and Recovery	9,426	\$222,907,186	\$2,551	\$2,551	2070
Brackish Groundwater Development <sup>2</sup>	Varies	Varies by project	Varies by WUG	Varies by WUG	2020
BWA Brackish Groundwater Development	3,136	\$33,246,167	\$579	\$370	2030
City of Houston Area 2 Groundwater Infrastructure	50,400	\$122,751,076	\$403	\$222	2030
Expanded Use of Groundwater <sup>2</sup>	31,000+	Varies by WUG	Varies by WUG	Varies by WUG	2020
GCWA Backup Well Development	1,120	\$1,346,492	\$169	\$84	2040
Groveton Groundwater Expansion	242	\$2,211,952	\$699	\$56	2020
SJRA Catahoula Aquifer Supplies	10,500	\$18,200,411	\$479	\$358	2040
<b>Groundwater Reduction Plans</b>					
CHCRWA GRP <sup>3</sup>	5,466	\$0	\$0	\$0	2030
City of Houston GRP <sup>3</sup>	124,914	\$0	\$0	\$0	2020
City of Missouri City GRP	25,760	\$87,837,323	\$405	\$165	2030
City of Richmond GRP	7,178	\$70,936,844	\$1,108	\$363	2020
City of Rosenberg GRP	3,920	\$12,963,110	\$261	\$29	2030
City of Sugar Land IWRP	15,492	\$133,134,039	\$1,210	\$390	2030
Fort Bend County MUD 25 GRP	1,120	\$26,718,250	\$2,541	\$862	2030
Fort Bend County WC&ID No. 2 GRP	6,720	\$63,535,966	\$1,106	\$440	2030
Montgomery County MUDs #8 and #9 GRP	2,240	\$30,510,375	\$1,875	\$917	2020
NFBWA GRP <sup>3</sup>	62,496	\$0	\$0	\$0	2030
NHCRA GRP <sup>3</sup>	143,360	\$0	\$0	\$0	2030
Porter SUD Joint GRP	2,240	\$26,862,533	\$1,542	\$699	2020
River Plantation and East Plantation Joint GRP <sup>4</sup>	51	\$0	\$0	\$0	2030
SJRA GRP	100,000	\$998,910,850	\$697	\$340	2030
WHCRA GRP <sup>3</sup>	92,288	\$0	\$0	\$0	2030

## Region H Initially Prepared Plan Key Project Overview

Project	Potential Volume <sup>1</sup> (ac-ft)	Capital Cost (\$)	Unit Cost (\$/ac-ft)		Start Decade
			Start Decade	2070	
<b>Reuse</b>					
City of Houston Reuse	242,554	\$555,093,732	\$373	\$139	2040
City of Pearland Reuse	1,154	\$12,648,000	\$913	\$142	2030
Galveston County Industrial Reuse	22,400	\$90,746,960	\$564	\$279	2030
NFBWA Member District Reuse	3,816	\$46,640,088	\$1,695	\$835	2020
NHCRWA Member District Reuse	300	\$4,295,775	\$1,913	\$905	2020
San Jacinto Basin Regional Return Flows <sup>3</sup>	119,673	\$0	\$0	\$0	2020
Wastewater Reclamation for Municipal Irrigation	19,776	\$181,028,438	\$1,308	\$896	2030
Westwood Shores MUD Reuse	150	\$2,031,251	\$1,921	\$968	2020
<b>Surface Water Development</b>					
Allens Creek Reservoir	99,650	\$365,446,301	\$211	\$39	2040
BRA System Operation Permit <sup>3</sup>	78,276	\$0	\$0	\$0	2020
Dow Reservoir and Pump Station Expansion	80,000	\$350,000,000	\$373	\$66	2020
Freeport Seawater Desalination	11,200	\$155,877,822	\$2,273	\$1,293	2040
Manvel Supply Expansion	15,680	\$269,052,608	\$1,488	\$309	2030
Mustang Reservoir Improvements	3,734	\$14,551,195	\$298	\$23	2020
NRG Cedar Bayou Desalination	22,400	\$342,840,391	\$2,637	\$1,560	2030
<b>Treatment</b>					
BWA Conventional Treatment Expansion	8,400	\$19,085,165	\$351	\$191	2030
City of Houston Treatment Expansion <sup>3</sup>	89,396	\$0	\$0	\$0	2040
City of Houston West Water Purification Plant	103,385	\$959,257,534	\$1,418	\$407	2040
GCWA Galveston County Treatment Expansion	22,400	\$167,919,105	\$894	\$367	2030
Northeast Water Purification Plant Expansion	448,000	\$2,179,413,588	\$615	\$272	2030
Pearland Surface Water Treatment Plant	22,400	\$232,787,093	\$973	\$242	2030
SEWPP Additional Module	22,400	\$97,597,266	\$497	\$191	2030
<b>Other Infrastructure</b>					
Brazos Saltwater Barrier	10,000	\$67,552,043	\$517	\$42	2040
Chocolate Bayou Pump Station Expansion	33,600	\$8,577,765	\$29	\$11	2020
Chocolate Bayou Saltwater Barrier Improvements	1,120	\$1,034,798	\$72	\$7	2020

1. Volumes listed in this table represent the maximum anticipated volume associated with the projects rather than new increments of yield. Volumes shown in this table may overlap and are not necessarily additive.
2. Includes brackish groundwater projects implemented under Expanded Use of Groundwater. Costs vary by Water User Group (WUG).
3. Costs, including construction costs, engineering, legal, and permitting fees, land acquisition, and other capital costs, are included under associated infrastructure projects.
4. Supply generated through expanded use of existing infrastructure. Cost estimated to be minimal.