

## Hal Bailey

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**From:** Chris Kozlowski  
**Sent:** Sunday, August 18, 2024 11:16 PM  
**To:** Hal Bailey  
**Cc:** Humberto Galvan  
**Subject:** Fw: Gulf Coast Water Authority - Submission re Pending Amendment Applications COA 12-5168, 12-5171, and 12-5322  
**Attachments:** Letter to TCEQ Withdrawing and Narrowing Amendments to Water Rights Signed BW 08.15.2024.pdf; TCEQ\_GCWA\_AP\_Report\_20240813.pdf; Water\_Right\_Accounting\_Plan\_Blank\_20240801.xlsm; Water\_Right\_Accounting\_Plan\_SyntheticTestData\_20240801.xlsm; 2024.08 Proposed Revisions to GCWA\_12-5322G\_Revised\_Draft\_Permit\_07.18.2022(116885188.1).docx

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**From:** Williams, Paulina <[paulina.williams@bakerbotts.com](mailto:paulina.williams@bakerbotts.com)>  
**Sent:** Friday, August 16, 2024 11:32 AM  
**To:** Kathy Alexander <[kathy.alexander@tceq.texas.gov](mailto:kathy.alexander@tceq.texas.gov)>; Ruth Takeda <[ruth.takeda@tceq.texas.gov](mailto:ruth.takeda@tceq.texas.gov)>  
**Cc:** Brandon Wade <[Bwade@gcwatx.gov](mailto:Bwade@gcwatx.gov)>; Jake Hollingsworth (<[jhollingsworth@gcwatx.gov](mailto:jhollingsworth@gcwatx.gov)>)  
<[jhollingsworth@gcwatx.gov](mailto:jhollingsworth@gcwatx.gov)>; Renee Dondonay <[Rdondonay@gcwatx.gov](mailto:Rdondonay@gcwatx.gov)>; Philip Taucer <[Philip.Taucer@freese.com](mailto:Philip.Taucer@freese.com)>  
**Subject:** Gulf Coast Water Authority - Submission re Pending Amendment Applications COA 12-5168, 12-5171, and 12-5322

Kathy and Ruth,

On behalf of Gulf Coast Water Authority, please find the attached withdrawal of applications to amendment COAs 12-5168 and 12-5171 and request to narrow the requested action on 12-5322 to only adopt an accounting plan per the special condition to effectuate diversions at previously authorized Diversion Point 2. The corresponding proposed accounting plan is attached. We have also included a redline of the 12-5322 draft permit amendment for your consideration.

Please let us know if you have any questions or would like to discuss. Thanks.

All the best,  
Paulina

**Paulina Williams**

Partner

**Baker Botts L.L.P.**

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Texas City, Texas 77591

409.935.2438

[www.gulfcoastwaterauthoritytx.gov](http://www.gulfcoastwaterauthoritytx.gov)

August 16, 2024

VIA EMAIL

Kathy Alexander, MC-160  
Ruth Ann Takeda, MC 173  
Texas Commission on Environmental Quality  
P.O. Box 13087  
Austin, TX 78711-3987

Re: Withdrawal of Requested Amendments to Certificate of Adjudication Nos. 12-5168 and 12-5171, and  
Narrowing of Requested Amendments to Certificate of Adjudication No. 12-5322

Dear Dr. Alexander and Ms. Takeda:

The Texas Commission on Environmental Quality ("TCEQ") has currently pending within the TCEQ Office of Water Gulf Coast Water Authority's ("GCWA's") applications to amend to Certificates of Adjudication ("CA") Nos. 12-5168, 12-5171, and 12-5322. Public notice of the requested amendments was published on September 12, 2022 and mailed on August 23, 2022.

GCWA has elected not to proceed with the requested amendments to CA Nos. 12-5168 and 12-5171 and hereby withdraws those two pending applications.

With respect to CA No. 12-5322, GCWA wishes to narrow the scope of its requested amendments. GCWA withdraws all amendment requests other than the amendment to effectuate Special Condition 5 in Amendment E to CA No. 12-5322. CA 12-5322E provided that prior to GCWA using the upstream diversion point authorized therein, GCWA would further amend 12-5322 to add provisions that GCWA have an approved accounting plan and requiring maintenance of that daily plan (the "Accounting Plan Amendment"). An updated version of GCWA's accounting plan, revised to reflect GCWA's withdrawal of all requested amendments other than the Accounting Plan Amendment, is attached hereto as Exhibit A. A markup of the draft permit for CA 12-5322 is provided to correspond to the narrowed scope of GCWA's amendment application as Exhibit B.

Three entities—Brazos River Authority, Brazosport Water Authority, and the Dow Chemical Company—requested a contested case hearing on the applications. After TCEQ has reviewed the attached accounting plan and confirmed GCWA has addressed any TCEQ questions or comments, GCWA understands that, absent the withdrawal of these hearing requestors, the application for CA 12-5322, consistent with this narrowed scope, would be directed to the TCEQ Agenda for consideration of referral to the State Office of Administrative Hearings.

If you have any questions, please feel free to contact me at (409) 797-4927 or [BWade@gcwatx.gov](mailto:BWade@gcwatx.gov), Jake Hollingsworth, Assistant General Manager, at (281) 967-1405 or [jhollingsworth@gcwatx.gov](mailto:jhollingsworth@gcwatx.gov), or Paulina Williams at (512) 322-2543 or [paulina.williams@bakerbotts.com](mailto:paulina.williams@bakerbotts.com).

Respectfully,

A handwritten signature in blue ink, appearing to read "Brandon Wade", is written over a light blue horizontal line.

Brandon Wade  
Gulf Coast Water Authority, General Manager

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, ~~Jones Creek, and Oyster  
Creek~~

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment (Diversion Point 2); and

~~WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for 75,000 acre-feet of water at 900 cfs (405,000 gpm); and;~~

~~WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and~~

~~WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and~~

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin to authorized all purposes of use including for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1.—USE

~~In addition to previous authorizations Owner is authorized:~~

~~A.—To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.~~

~~B.—To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.~~

C.—An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

#### DIVERSION

D.—In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:

- 1.—The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
- 2.—The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
- 3.—The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.

E.—Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

#### 2.—PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for 75,000 acre-feet of water at 900 cfs (405,000 gpm).

#### 3.—CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

#### 4.—SPECIAL CONDITIONS

A.—Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens.

B.—Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000—Brazos River at Richmond, TX, as set forth in Paragraphs 6.C.—6.F. below:

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

C.—Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000—Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner under this Certificate. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.

If average adjusted streamflow at USGS Gage No. 08114000—Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Base Flow Special Condition**

D.—If average adjusted streamflow at USGS Gage No. 08114000—Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage below the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Other 1. Special Conditions**

E.—Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1983 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any

requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

~~F.—Diversion of water from Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.~~

~~1.—~~ Owner shall only divert water ~~at authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. Diversion Point 2~~ in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.

~~G.—Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.~~

~~H.—Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.~~

~~I.—Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.~~

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

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| This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:

DRAFT



**Gulf Coast Water Authority ADJ No. 12-5322G**

August 1, 2024

Accounting Plan with text file available upon request

**Blank Data**

Contact Mr. Chris Kozlowski at (512) 239-1801

**Gulf Coast Water Authority ADJ No. 12-5322G**

August 1, 2024

Accounting Plan with text file available upon request

**Synthetic Test Data**

Contact Mr. Chris Kozlowski at (512) 239-1801

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

### APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the Certificate, and to add a purpose of use to an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the Certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificate of Adjudication Nos. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for 75,000 acre-feet of water at 900 cfs (405,000 gpm).

GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin to authorize all purposes of use including for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written

request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued: August 23, 2022

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin to authorized all purposes of use including for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

- C. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

## 2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:

1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.

- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

## 3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for 75,000 acre-feet of water at 900 cfs (405,000 gpm).

## 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

## 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens.



- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

**Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner under this Certificate. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage below the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Other Special Conditions**

- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1983 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner’s discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any

requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

- H. Diversion of water from Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:

DRAFT

## Hal Bailey

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**From:** Williams, Paulina <Paulina.Williams@bakerbotts.com>  
**Sent:** Tuesday, July 19, 2022 7:48 AM  
**To:** Brooke McGregor  
**Cc:** Chris Kozlowski; Kathy Alexander; pdonart@gcwatx.gov; Hal Bailey  
**Subject:** RE: Gulf Coast Water Authority (GCWA) Application No. 12-5322G Revised Draft Permit & Notice Applicant Review

Thanks Brooke. These look great and are much appreciated.

Best,  
Paulina

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**From:** Brooke McGregor <[brooke.mcgregor@tceq.texas.gov](mailto:brooke.mcgregor@tceq.texas.gov)>  
**Sent:** Monday, July 18, 2022 11:55 AM  
**To:** Williams, Paulina <[Paulina.Williams@bakerbotts.com](mailto:Paulina.Williams@bakerbotts.com)>  
**Cc:** Chris Kozlowski <[Chris.Kozlowski@tceq.texas.gov](mailto:Chris.Kozlowski@tceq.texas.gov)>; Kathy Alexander <[kathy.alexander@tceq.texas.gov](mailto:kathy.alexander@tceq.texas.gov)>;  
[pdonart@gcwatx.gov](mailto:pdonart@gcwatx.gov); Hal Bailey <[Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)>  
**Subject:** RE: Gulf Coast Water Authority (GCWA) Application No. 12-5322G Revised Draft Permit & Notice Applicant Review

[EXTERNAL EMAIL]

Good Morning Paulina,

Please see the following attachments for the notice and draft amendment for 12-5168; 12-5171- and 12-5322. This is what we will be sending to the Office of Chief Clerk for notice.

Thank you,



Brooke McGregor  
Manager  
Water Rights Permitting and Availability Section  
Water Availability Division  
(512) 239-2025

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the Certificate, and to add a purpose of use to an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the Certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificate of Adjudication Nos. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for 75,000 acre-feet of water at 900 cfs (405,000 gpm).

GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin to authorize all purposes of use including for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written

request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and



WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin to authorized all purposes of use including for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

- C. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

## 2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:
  - 1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
  - 2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
  - 3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.
- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

## 3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for 75,000 acre-feet of water at 900 cfs (405,000 gpm).

## 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

## 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens.

- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

**Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner under this Certificate. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage below the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Other Special Conditions**

- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1983 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner’s discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any

requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

- H. Diversion of water from Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:

DRAFT

## Hal Bailey

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**From:** Williams, Paulina <Paulina.Williams@bakerbotts.com>  
**Sent:** Thursday, July 14, 2022 2:35 PM  
**To:** Hal Bailey  
**Cc:** Chris Kozlowski; Kathy Alexander; Brooke McGregor; pdonart@gcwatx.gov  
**Subject:** RE: Gulf Coast Water Authority (GCWA) Application No. 12-5322G Revised Draft Permit & Notice Applicant Review  
**Attachments:** GCWA\_12-5168C\_Revised\_Draft\_Permit\_07.05.2022\_Active\_99121711\_1.DOCX; GCWA\_12-5171B\_Revised\_Draft\_Permit\_07.05.2022\_Active\_99122058\_1.DOCX; GCWA\_12-5322G\_Revised\_Draft\_Permit\_07.05.2022\_Active\_99122250\_1.DOCX; GCWA\_12-5322G\_Revised\_Draft\_Notice\_07.05.2022\_Active\_99122169\_1.DOCX; GCWA\_12-5171B\_Revised\_Draft\_Notice\_07.05.2022\_Active\_99121786\_1.DOCX; GCWA\_12-5168C\_Revised\_Draft\_Notice\_07.05.2022\_Active\_99121707\_1.DOCX

Hi Hal,

On behalf of GCWA, I am attaching the notice and draft permit for each of 12-5168; 12-5171- and 12-5322 with some suggested revisions in track changes.

Please let us know if there are any questions or if a call would be useful.

All the best,  
Paulina

**Paulina Williams**  
Partner

**Baker Botts L.L.P.**  
[paulina.williams@bakerbotts.com](mailto:paulina.williams@bakerbotts.com)  
T +1.512.322.2543  
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# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the Certificate, and to add a purpose of use to an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the Certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificate of Adjudication Nos. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for ~~the first~~ 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for ~~the next~~ 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for ~~the remaining~~ 75,000 acre-feet of water at 900 cfs (405,000 gpm).

GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin ~~for all~~ authorized all purposes of use ~~and including~~ for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written



request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



### AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner:	Gulf Coast Water Authority	Address:	3630 FM 1765 Texas City, Texas 77591
Filed:	March 1, 2019	Granted:	
Purposes:	Municipal, Industrial, Agricultural, & Mining	Counties:	Harris, Fort Bend, Brazoria, & Galveston
Watercourse:	Brazos River, Jones Creek, and Oyster Creek	Watersheds:	Brazos and San Jacinto River Basins, and San Jacinto-Brazos Coastal Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of ~~the first~~ 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for ~~the next~~ 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for ~~the remaining~~ 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an additional purpose of use in an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin ~~for aHto~~ authorized all purposes of use ~~and including~~ for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

- C. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

## 2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:
  - 1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
  - 2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
  - 3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.
- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

## 3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for ~~the first~~ 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for ~~the next~~ 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for ~~the remaining~~ 75,000 acre-feet of water at 900 cfs (405,000 gpm).

## 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

## 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens.

- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

**Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner under this Certificate. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage below the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Other Special Conditions**

- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1983 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any

requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

- H. Diversion of water from Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

**Commented [WP1]:** Inconsistent with treatment in all past permits that already include the exempt IBT.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

---

For the Commission

Date Issued:

DRAFT

## Hal Bailey

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**From:** Williams, Paulina <Paulina.Williams@bakerbotts.com>  
**Sent:** Tuesday, July 12, 2022 1:23 PM  
**To:** Chris Kozlowski; Hal Bailey  
**Subject:** RE: Gulf Coast Water Authority (GCWA) Applications

Thanks!

---

**From:** Chris Kozlowski <[chris.kozlowski@tceq.texas.gov](mailto:chris.kozlowski@tceq.texas.gov)>  
**Sent:** Tuesday, July 12, 2022 1:10 PM  
**To:** Hal Bailey <[Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)>; Williams, Paulina <[Paulina.Williams@bakerbotts.com](mailto:Paulina.Williams@bakerbotts.com)>  
**Subject:** Re: Gulf Coast Water Authority (GCWA) Applications

[EXTERNAL EMAIL]

Attached are the word versions of the draft amendment and notice for all three. Let me know if you have any questions. Thanks.

Chris Kozlowski, Team Leader  
Water Rights Permitting Team  
Water Availability Division  
TCEQ

### Confidentiality Notice:

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# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the Certificate, and to add a purpose of use to an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the Certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificate of Adjudication Nos. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

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The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written

request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

- C. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

## 2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:
  - 1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
  - 2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
  - 3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.
- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

## 3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

## 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

## 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens.

- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

**Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner under this Certificate. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage below the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Other Special Conditions**

- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1983 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner’s discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any

requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

- H. Diversion of water from Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.



This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:

DRAFT

## Hal Bailey

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**From:** Williams, Paulina <paulina.williams@bakerbotts.com>  
**Sent:** Friday, July 8, 2022 6:47 AM  
**To:** Hal Bailey; Kathy Alexander  
**Subject:** RE: Gulf Coast Water Authority (GCWA) Applications

Hi,  
Would it be possible to have the Word version? Thanks.  
Paulina

### Confidentiality Notice:

The information contained in this email and any attachments is intended only for the recipient[s] listed above and may be privileged and confidential. Any dissemination, copying, or use of or reliance upon such information by or to anyone other than the recipient[s] listed above is prohibited. If you have received this message in error, please notify the sender immediately at the email address above and destroy any and all copies of this message.

## Hal Bailey

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**From:** Hal Bailey  
**Sent:** Tuesday, July 5, 2022 10:51 AM  
**To:** pdonart@gcwatx.gov  
**Cc:** Williams, Paulina; Chris Kozlowski; Kathy Alexander; Brooke McGregor  
**Subject:** Gulf Coast Water Authority (GCWA) Application No. 12-5322G Revised Draft Permit & Notice Applicant Review  
**Attachments:** GCWA\_12-5322G\_Revised\_Draft\_Permit\_Package\_07.05.2022.pdf

Good morning Mr. Donart,

Attached are the draft public notice and amendment for application no. 12-5322G, revised with edits provided by GCWA.

Please review the draft documents and provide any comments and/or additional edits by COB on 07/19/2022.

Thank you,

*Hal E. Bailey, Jr.  
Natural Resources Specialist III  
Water Rights Permitting Team  
Water Availability Division  
Texas Commission on Environmental Quality  
512-239-4615 [Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the Certificate, and to add a purpose of use to an existing exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the Certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificate of Adjudication Nos. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written

request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.



- C. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

## 2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:
  - 1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
  - 2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
  - 3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.
- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

## 3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

## 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

## 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens.

- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

**Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner under this Certificate. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage below the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Other Special Conditions**

- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1983 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner’s discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any

requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

- H. Diversion of water from Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:

DRAFT

## Hal Bailey

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**From:** Williams, Paulina <paulina.williams@bakerbotts.com>  
**Sent:** Monday, June 13, 2022 1:56 PM  
**To:** Hal Bailey  
**Cc:** Kathy Alexander; Brooke McGregor; Chris Kozlowski  
**Subject:** RE: Gulf Coast Water Authority Application No. 12-5168C / 12-5171B / 12-5322G Draft Permit/Notice Applicant Review  
**Attachments:** 2022.04.15 -Comments - GCWA\_12-5322G\_Draft\_Permit\_Package\_03.31.2022\_Active\_89072367\_2.DOCX; 2022.04.15 - Comments - GCWA\_12-5168C\_Draft\_Permit\_Package\_03.31.2022 (002)\_Active\_89381803\_3.DOCX; 2022.04.15 - Comments - GCWA\_12-5171B\_Draft\_Permit\_Package\_03.31\_Active\_89001168\_2.DOCX

Hal,  
Please see attached. I hope these help and please let me know if there are any issues. Thanks.

Paulina

### Confidentiality Notice:

The information contained in this email and any attachments is intended only for the recipient[s] listed above and may be privileged and confidential. Any dissemination, copying, or use of or reliance upon such information by or to anyone other than the recipient[s] listed above is prohibited. If you have received this message in error, please notify the sender immediately at the email address above and destroy any and all copies of this message.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



NOTICE OF AN APPLICATION TO  
AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, ~~to remove acreage limitations for agricultural use,~~ to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the ~~certificate~~Certificate, and to ~~add a purpose of use to an existing authorize an~~ exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificates of Adjudication No. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for ~~diversion and use of~~ the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955,

for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

~~The original Certificate issued on January 14, 1988 includes Paragraph 2. USE, which states, “Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas.”~~

~~Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, “In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas and Owner owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner’s owner’s service area.”~~

GCWA seeks to amend Certificate of Adjudication no. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA’s service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorizations ~~for use of the bed and banks of Jones and Oyster Creeks~~ in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

GCWA further seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2. of the Certificate and Paragraph 1. of Certificate No. 12-5322B to remove the acreage limitations for agricultural use.

PRIVILEGED & CONFIDENTIAL  
ATTORNEY-CLIENT COMMUNICATIONS  
ATTORNEY WORK PRODUCT

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.



Markup – 4/14/2022

PRIVILEGED & CONFIDENTIAL  
ATTORNEY-CLIENT COMMUNICATIONS  
ATTORNEY WORK PRODUCT

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



AMENDMENT TO A  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial,  
Agricultural, & Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

~~WHEREAS, the original Certificate of Adjudication No. 12-5322 issued on January 14, 1988 includes Paragraph 2. USE, which states, “Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas”; and~~

~~WHEREAS, Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, “In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas and Owner owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner’s owner’s service area”; and<sup>1</sup>~~

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA’s service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization ~~for use of the bed and banks of Jones and Oyster Creeks~~ in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

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<sup>1</sup> COA 12-5322C provided a new Use Paragraph 1 that was applied “in lieu” of the prior Use provisions in 12-5322, as amended.” Having identified that prior change, GCWA is withdrawing its request to address the already overridden paragraphs.

~~WHEREAS, GCWA also seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate of Adjudication No. 12-5322B to remove the acreage limitations for agricultural use; and~~

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.
- C. ~~To use the authorized 155,000 acre-feet of water per year for agricultural purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties without limitation on the acreage to be irrigated.~~
- D. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:

1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.

B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, ~~that~~ each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

5. SPECIAL CONDITIONS

A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens at any new diversion structures.

- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner [under this Certificate](#). Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Base Flow Special Condition**

- [F.](#) If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage ~~to below~~ the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Other Special Conditions**

- ~~F.~~[G.](#) Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, ~~1982-1983~~ prior to diverting up to 40,000 acre-feet

per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

~~G.H.~~ Diversion of water ~~diverted from the Brazos River and discharged into~~ Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.

~~H.I.~~ Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.

~~I.J.~~ Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.

~~J.K.~~ Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.

~~K.L.~~ Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:



## Hal Bailey

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**From:** Hal Bailey  
**Sent:** Monday, June 13, 2022 1:07 PM  
**To:** Williams, Paulina  
**Cc:** Kathy Alexander; Brooke McGregor; Chris Kozlowski  
**Subject:** RE: Gulf Coast Water Authority Application No. 12-5168C / 12-5171B / 12-5322G Draft Permit/Notice Applicant Review

Good afternoon Paulina,

Thank you for providing your comments and edits to the drafts. I was asked to request that you resubmit them in Word format so that staff may complete their reviews. It makes it easier for us to accept the changes where needed and make the revisions to the documents.  
Please let me know if you have any questions.

Thank you very much,

*Hal E. Bailey, Jr.  
Natural Resources Specialist III  
Water Rights Permitting Team  
Water Availability Division  
Texas Commission on Environmental Quality  
512-239-4615 [Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)*

## Hal Bailey

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**From:** Williams, Paulina <Paulina.Williams@BakerBotts.com>  
**Sent:** Friday, April 15, 2022 4:51 PM  
**To:** Hal Bailey  
**Cc:** Kathy Alexander; Brooke McGregor; Chris Kozlowski; Ruth Takeda; 'Brandon Wade'; pdonart@gcwatx.gov  
**Subject:** RE: Gulf Coast Water Authority Application No. 12-5168C / 12-5171B / 12-5322G Draft Permit/Notice Applicant Review  
**Attachments:** 2022.04.15 - Comments - GCWA\_12-5168C\_Draft\_Permit\_Package\_03.31.2022.pdf; 2022.04.15 - Comments - GCWA\_12-5171B\_Draft\_Permit\_Package\_03.31.2022.pdf; 2022.04.15 - Comments - GCWA\_12-5322G\_Draft\_Permit\_Package\_03.31.2022.pdf

Hal,  
On behalf of GCWA, attached please find comments on the initial draft permits for the amendments to COA 12-5168; COA 12-5171; and COA 12-5322. To avoid some oddities in formatting, we are sending these in pdf form. Note that there were some TCEQ track changes in 12-5168 as received but we accepted those to clarify our comments. We are happy to share these comments in Word format if you'd like; please let us know.

With respect to 12-5322G, GCWA is withdrawing its request to address Paragraph 2 of the original COA and Paragraph 1 of amendment B because, on further review, amendment COA 12-5322C has already overridden those prior Use paragraphs with a new paragraph that provides that it operates "In lieu of the purpose of use authorizations of Certificate of Adjudication 12-5322, as amended." We have noted this in the attached.

With respect to 12-5168C, GCWA would like to point out that we identified a request to address an acreage restriction in Use Paragraph 2(B) and it was not yet address in the initial draft permit. (It is described in Attachment 11 of the Supplement Report in the application). We have suggested some language that takes the same approach used for a similar action in 12-5171.

In addition, we did notice two things in the Tech Memos that we wanted to bring to your attention. In the 12-5168 Tech Memos the citation to 30 TAC 298.480(18) refers to the Richmond gage when it should be (19) to refer to Rosharon. In addition, while not in operative language, the references to base flow may be confusing given that only subsistence flow is recommended. In the Tech Memo for 12-5171, it refers only to subsistence flow, which seemed more clear. In the Tech Memo for 12-5171, the same citation change to (19) for Rosharon would apply as well.

Otherwise, we hope that the comments are clear in the markups but are happy to discuss further or answer any questions.

Thanks very much and have a great weekend.

Paulina

**Paulina Williams**  
512.322.2543 - Direct  
512.322.3643 - Fax  
[paulina.williams@bakerbotts.com](mailto:paulina.williams@bakerbotts.com)

Baker Botts L.L.P.  
98 San Jacinto Blvd.

Suite 1500  
Austin, Texas 78701

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



NOTICE OF AN APPLICATION TO  
AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, ~~to remove acreage limitations for agricultural use,~~ to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the ~~certificate~~ Certificate, and to add a purpose of use to an existing ~~authorize an~~ exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the certificate to expressly authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a) for three concurrent amendment applications: Certificates of Adjudication No. 12-5168C; 12-5171B; and 12-5322G.

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for ~~diversion and use of~~ the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955,

for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

~~The original Certificate issued on January 14, 1988 includes Paragraph 2. USE, which states, “Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas.”~~

~~Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, “In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas and Owner owner is authorized to divert and use not to exceed 10,000 acre feet of water per annum for industrial purposes within the Owner’s owner’s service area.”~~

GCWA seeks to amend Certificate of Adjudication no. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA’s service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization ~~s for use of the bed and banks of Jones and Oyster Creeks~~ in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water.

GCWA further seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2. of the Certificate and Paragraph 1. of Certificate No. 12-5322B to remove the acreage limitations for agricultural use.

PRIVILEGED & CONFIDENTIAL  
ATTORNEY-CLIENT COMMUNICATIONS  
ATTORNEY WORK PRODUCT

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director's draft amendment are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

Markup – 4/14/2022

PRIVILEGED & CONFIDENTIAL  
ATTORNEY-CLIENT COMMUNICATIONS  
ATTORNEY WORK PRODUCT

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



AMENDMENT TO A  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial,  
Agricultural, & Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,



~~WHEREAS, the original Certificate of Adjudication No. 12-5322 issued on January 14, 1988 includes Paragraph 2. USE, which states, “Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas”; and~~

~~WHEREAS, Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, “In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas and Owner owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner’s owner’s service area”; and<sup>1</sup>~~

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA’s service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization ~~for use of the bed and banks of Jones and Oyster Creeks~~ in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to expressly allow GCWA to divert junior priority water before senior priority water; and

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<sup>1</sup> COA 12-5322C provided a new Use Paragraph 1 that was applied “in lieu” of the prior Use provisions in 12-5322, as amended.” Having identified that prior change, GCWA is withdrawing its request to address the already overridden paragraphs.

~~WHEREAS, GCWA also seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate of Adjudication No. 12-5322B to remove the acreage limitations for agricultural use; and~~

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.
- C. ~~To use the authorized 155,000 acre-feet of water per year for agricultural purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties without limitation on the acreage to be irrigated.~~
- D. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:

1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.

B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that, in every wholesale water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, ~~that~~ each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

5. SPECIAL CONDITIONS

A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement from any new diversion structures. Such measures shall include, but shall not be limited to, the installation of screens ~~at any new diversion structures~~.

- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. – 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The “average adjusted streamflow” at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The “adjusted streamflow” at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner [under this Certificate](#). Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Base Flow Special Condition**

- [F.](#) If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage ~~to below~~ the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Other Special Conditions**

- ~~F.~~[G.](#) Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, ~~1982-1983~~ prior to diverting up to 40,000 acre-feet

per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any requirements and orders of the Brazos Watermaster made in accordance with Texas Water Code § 11.027 and other applicable law.

~~G.H.~~ Diversion of water ~~diverted from the Brazos River and discharged into~~ Jones and Oyster Creeks under this Certificate shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones and Oyster Creeks from the Brazos River, less calculated losses.

~~H.I.~~ Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either resume maintenance of the accounting plan, apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to resume maintenance of the accounting plan, amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.

~~I.J.~~ Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.

~~J.K.~~ Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.

~~K.L.~~ Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:

## Hal Bailey

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**From:** Hal Bailey  
**Sent:** Monday, April 4, 2022 10:22 AM  
**To:** pdonart@gcwatx.gov  
**Cc:** Kathy Alexander; Brooke McGregor; Chris Kozlowski; paulina.williams@bakerbotts.com  
**Subject:** FW: Gulf Coast Water Authority Application No. 12-5322G Draft Permit/Notice Applicant Review  
**Attachments:** GCWA\_12-5322G\_Draft\_Permit\_Package\_03.31.2022.pdf

Good morning Mr. Donart,

Attached is the draft amendment package for application no. 12-5322G. Kathy let me know that you didn't receive the email below on 03/31/2022.

Please confirm receipt. I will send the other drafts in separate emails. Please provide comments or edits by COB on 04/14/2022.

If you need additional time to respond, please let me know prior to the deadline.

Thank you,

*Hal E. Bailey, Jr.*  
*Natural Resources Specialist III*  
*Water Rights Permitting Team*  
*Water Availability Division*  
*Texas Commission on Environmental Quality*  
512-239-4615 [Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)

---

**From:** Hal Bailey  
**Sent:** Thursday, March 31, 2022 9:22 AM  
**To:** pdonart@gcwatx.gov  
**Cc:** Chris Kozlowski <Chris.Kozlowski@tceq.texas.gov>; Brooke McGregor <Brooke.McGregor@tceq.texas.gov>  
**Subject:** Gulf Coast Water Authority Application No. 12-5322G Draft Permit/Notice Applicant Review

Good morning Mr. Donart,

Attached is the draft amendment/notice package for Gulf Coast Water Authority application no. 12-5322G.

Please review the draft documents and provide any comments and/or edits by COB on 04/14/2022.

If you have any questions, please feel free to let me know.

Thank you,

*Hal E. Bailey, Jr.*  
*Natural Resources Specialist III*  
*Water Rights Permitting Team*  
*Water Availability Division*  
*Texas Commission on Environmental Quality*

512-239-4615 [Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)



Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

March 31, 2022

Mr. Patrick Donart, P.E., CFM  
Gulf Coast Water Authority  
3630 FM 1765  
Texas City, Texas 77591-4824

**VIA E-MAIL**

RE: Gulf Coast Water Authority  
ADJ 5322  
CN600566152, RN104059472  
Application No. 12-5322G to Amend Certificate of Adjudication No. 12-5322  
Texas Water Code §§ 11.122, 11.085, 11.042, Requiring Mailed and Published Notice  
Brazos River, Jones Creek and Oyster Creek, Brazos River Basin and San Jacinto-Brazos  
Coastal Basin  
Brazoria, Fort Bend, Galveston, and Harris counties

Dear Mr. Donart:

Drafts, subject to revision, of the public notice, proposed amendment to Certificate of Adjudication No. 12-5322, and the related technical memoranda are attached.

Staff is recommending that the referenced application be granted in accordance with the attached drafts. Please review the drafts and contact me no later than April 14, 2022 with any comments or questions as the notice will be forwarded to the Office of the Chief Clerk for mailing after that date.

Please note this application requires a 30-day comment period and once the comment period has closed, the proposed amendment to Certificate of Adjudication No. 12-5322 may be issued as drafted given no hearing requests are received.

If you have any questions concerning the application, please contact me via e-mail at [hal.bailey@tceq.texas.gov](mailto:hal.bailey@tceq.texas.gov) or by telephone at (512) 239-4615.

Sincerely,

A handwritten signature in cursive script that reads "Hal E. Bailey, Jr.".

Hal E. Bailey, Jr., Project Manager  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section

Attachments

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to remove acreage limitations for agricultural use, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the certificate, and to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the certificate to authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a).

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

The original Certificate issued on January 14, 1988 includes Paragraph 2. USE, which states, *“Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas.”*

Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, *“In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner’s service area.”*

GCWA seeks to amend Certificate of Adjudication no. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA’s service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization for use of the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

GCWA further seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2. of the Certificate and Paragraph 1. of Certificate No. 12-5322B to remove the acreage limitations for agricultural use.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director’s draft amendment are available for viewing on

the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, the original Certificate of Adjudication No. 12-5322 issued on January 14, 1988 includes Paragraph 2. USE, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas*"; and

WHEREAS, Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, *"In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area"*; and

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization for use of the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, GCWA also seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate of Adjudication No. 12-5322B to remove the acreage limitations for agricultural use; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.
- C. To use the authorized 155,000 acre-feet of water per year for agricultural purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties without limitation on the acreage to be irrigated.
- D. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:
  1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
  2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
  3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.
- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for the next

40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

#### 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.

#### 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens at any new diversion structures.
- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 - Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. - 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 - Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The "average adjusted streamflow" at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The "adjusted streamflow" at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 - Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and



the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

#### **Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.
- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1982 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any requirements and orders of the Brazos Watermaster.
- H. Diversion of water diverted from the Brazos River and discharged into Jones and Oyster Creeks shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones Creek less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

-----  
For the Commission

Date Issued:

**Texas Commission on Environmental Quality**

INTEROFFICE MEMORANDUM

To: Hal Bailey, Project Manager  
Water Rights Permitting Team

Date: February 17, 2022

Through: *KA* Kathy Alexander, Ph.D., Policy and Technical Analyst  
Water Availability Division

*TG* Trent Gay, Team Leader  
Surface Water Availability Team

From: Steven Mahr, Hydrologist  
Surface Water Availability Team

Subject: Gulf Coast Water Authority  
ADJ 5322  
CN600566152  
Brazos River, Brazos River Basin  
Brazoria, Fort Bend, Galveston, Harris counties

**WATER AVAILABILITY REVIEW**

**Application Summary**

Certificate of Adjudication No. 12-5322G (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin for industrial, municipal, and agricultural purposes within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties. GCWA is further authorized an exempt interbasin transfer (IBT) of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural purposes.

The Certificate includes Paragraph 2, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*"

Certificate No. 12-5322B includes Paragraph 1, which states, "*In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area.*"

GCWA requests to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B to remove the acreage limitations for agricultural use. In addition, GCWA requests to amend the Certificate to add mining use to all the authorized water, to add a diversion point, to convert all three authorized diversion points to diversion reaches, and to authorize an exempt IBT from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also requests authorization to use the bed and banks of Jones and Oyster Creeks and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

GCWA submitted an accounting plan to track diversions of water authorized under this Certificate, in combination with Certificate Nos. 12-5168 and 12-5171 held by the owner, according to priority date and source.

The application was declared administratively complete on March 1, 2019.

### **Water Availability Review and No Injury Analysis**

Resource Protection staff recommend that the application be subject to instream flow requirements. Specific instream flow requirements are included in Resource Protection staff's January 21, 2022 memorandum.

The application does not request a new appropriation of water; therefore, a water availability analysis is not necessary. However, the requests to add a diversion point, modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B, add a bed and banks authorization, add purposes of use to an existing IBT, and to authorize diversion of junior priority water before senior priority water must be reviewed to ensure that no water rights are affected by the requests.

The Water Rights Analysis Package (WRAP) simulates management of the water resources of a river basin. TCEQ uses WRAP in the evaluation of water right permit applications using priority-based water allocations. WRAP is a generalized simulation model for application to any river basin, and input datasets must be developed for the particular river basin of concern. The TCEQ developed water availability models (WAMs) for Texas river basins that include geographical information, water right information, naturalized flows, evaporation rates, channel losses, and specific management assumptions. Hydrology staff operates WRAP to evaluate water rights applications to determine water availability and to ensure that senior water rights are protected.

Staff used the Full Authorization simulation of the Brazos River WAM, where all water rights use their maximum authorized amount and return flows are not included, to evaluate impacts on other water rights as a result of converting the diversion points to diversion reaches and diverting the authorized water at the requested upstream diversion location. The period of record for the Brazos River WAM is 1940 to 2018.

Staff first modeled the application at the two existing diversion points such that diversions are taken first at the upstream point and any remaining diversions are taken at the downstream point. Staff then added the proposed additional upstream diversion point (the most upstream point) and modeled the application such that diversions are taken at the three points in upstream to downstream succession with the recommended environmental flow restrictions applied at the additional upstream point. For modeling purposes, Staff used the existing and proposed diversion points to represent the proposed reaches. Staff believes that this representation is appropriate because no other water rights fall within the proposed reaches, and the reaches encompass the existing and proposed diversion points. Staff compared the pre- and post-application volume reliabilities for all basin water rights and found negative impacts to 39 water rights, or portions of those water rights, ranging from -0.01% to -0.29% with an average impact of -0.08%. Staff notes that no municipal water rights that were 100 per cent reliable in the pre-application simulation were reduced in the post-application simulation. Staff is of the opinion that the application will not have an effect on other water rights in the basin.

Regarding the request to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B, which include specific requirements regarding the amount and acreage location for irrigation diversions, GCWA's application indicates that the limitations are no longer applicable because of the nature of their wholesale operations. Additionally, the application requests to add mining use to all authorized water and to add additional purposes of use to the existing IBT for all authorized water. Staff reviewed the application materials and agrees that Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B contain language that is no longer applicable.

Regarding the request to add additional purposes of use to an existing exempt IBT to the San Jacinto-Brazos Coastal Basin, reviews of requests for IBTs are conducted in accordance with Chapter §11.085 of the Texas Water Code (TWC) and TCEQ rules regarding IBTs. GCWA's request for an IBT is exempt under TWC §11.085(v)(3) and (v)(4). Therefore, staff did not perform a review under TWC §11.085.

Regarding the request use the bed and banks of Jones and Oyster Creeks to convey water diverted from the Brazos River, the application included the information required in 30 TAC §295.113. Based on a February 1999 report titled Water Audit and Water Use Projections, GCWA has estimated that conveyance losses will be approximately 20% of the discharged volume over the 75 mile extent of the of the American canal system, including the 42 mile portion of the Jones and Oyster Creeks conveyance reaches. Staff evaluated the estimated losses and found them adequate.

Regarding GCWA's request to authorize diversion of junior water before more senior water, staff notes that the Certificate includes priority dates for diversion of water from the Brazos River of February 8, 1929, March 14, 1955 and July 25, 1983. TCEQ's rules (30 TAC §297.58(b), Accounting Water Use) provide that if a water right has appropriations with different priority dates, the oldest priority water shall be credited against the water first used unless the water right expressly provides otherwise. GCWA's diversions from the Brazos River are subject to the requirements and orders of the Brazos Watermaster. Water right holders in a Watermaster area are required to notify the Watermaster prior to diversion, and the Watermaster tracks the amount of water used at each priority date. The Brazos Watermaster actively manages water rights on a daily basis and protects senior water rights in times of shortage. GCWA has submitted an accounting plan that accounts for diversions at all priority dates and locations, including the new diversion points. Staff's opinion is that this request will not impact other water rights.

GCWA submitted an accounting plan (*Water Right Accounting Plan for Gulf Coast Water Authority*) that accounts for diversions at the new diversion points, as requested in this application, in combination with two concurrent applications by GCWA (Application Nos. 12-5168C and 12-5171B). Staff reviewed the accounting plan and found it adequate to demonstrate compliance with the terms and conditions of the proposed amendment.

## Conclusion

Staff is of the opinion that if GCWA manages diversions in accordance with the approved accounting plan and the requirements of the Brazos Watermaster, the application will not affect existing water rights. Therefore, Hydrology staff can support granting the application.

Staff recommends that the following special conditions be included in the amendment:

1. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1982 prior to diverting up to 40,000 acre-feet per year with a

time priority of March 14, 1955, or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any requirements and orders of the Brazos Watermaster.

2. Diversion of water diverted from the Brazos River and discharged into Jones and Oyster Creeks shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones Creek less calculated losses.
3. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.

*Steven Mahr*

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Steven Mahr, Hydrologist

# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

**To:** Hal Bailey, Project Manager  
Water Rights Permitting Team

**Date:** January 21, 2022

**Through:** Leslie Patterson, Team Leader  
Resource Protection Team



Kristin Wang, Senior Water Conservation Specialist  
Resource Protection Team

**From:** Jennifer Allis, Senior Water Conservation Specialist  
Resource Protection Team

**Subject:** Gulf Coast Water Authority  
ADJ 5322  
CN600566152  
Brazos River, Brazos River Basin  
Fort Bend County

### APPLICATION SUMMARY

Certificate of Adjudication No. 12-5322 (Certificate), as amended, authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin for industrial, municipal, and agricultural purposes within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties. GCWA is further authorized an exempt interbasin transfer (IBT) of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural purposes.

The original Certificate includes Paragraph 2, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*"

Certificate No. 12-5322B includes Paragraph 1, which states, "*In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area.*"

GCWA requests to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B to remove the acreage limitations for agricultural use. In addition, GCWA requests to amend the Certificate to add mining use to all the authorized water, to add a diversion point, to convert all three authorized diversion points to diversion reaches, and to authorize an exempt IBT from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also requests authorization to use the bed and banks of Jones and Oyster Creeks and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

### **WATER CONSERVATION REVIEW**

Pursuant to Title 30 Texas Administrative Code (TAC) §295.9(4), applications requesting to change the place and/or purpose of use require the submittal of water conservation and drought contingency plans.

As a wholesale water supplier, GCWA submitted water conservation and drought contingency plans. Resource Protection staff reviewed the water conservation and drought contingency plans and found that the plans meet the requirements in 30 TAC §§ 288.5 and 288.22.

The application is consistent with the 2021 Region H Water Plan and the 2022 State Water Plan because there is nothing in the water plans that conflicts with issuing this proposed amendment.

### **RECOMMENDATIONS**

The following water conservation language should be included in the proposed amendment, if granted:

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.



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Jennifer Allis, Senior Water Conservation Specialist




# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

To: Hal Bailey, Project Manager  
Water Rights Permitting Team

Through: Leslie Patterson, Team Leader  
 Resource Protection Team

From: George Gable, Aquatic Scientist  
Resource Protection Team

Subject: Gulf Coast Water Authority  
ADJ 5322  
CN600566152  
Brazos River, Brazos River Basin  
Fort Bend County

Date: January 21, 2022

Environmental reviews of water right applications are conducted in accordance with applicable provisions of the Texas Water Code (TWC) and the administrative rules of the Texas Commission on Environmental Quality (TCEQ). The provisions applicable to environmental reviews can vary according to the type and the location of the authorization requested.

### APPLICATION SUMMARY

Certificate of Adjudication No. 12-5322 (Certificate), as amended, authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin for industrial, municipal, and agricultural purposes within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties. GCWA is further authorized an exempt interbasin transfer (IBT) of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural purposes.

The original Certificate includes Paragraph 2, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*"

Certificate No. 12-5322B includes Paragraph 1, which states, "*In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of*

*land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area."*

GCWA requests to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B to remove the acreage limitations for agricultural use. In addition, GCWA requests to amend the Certificate to add mining use to all the authorized water, to add a diversion point, to convert all three authorized diversion points to diversion reaches, and to authorize an exempt IBT from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also requests authorization to use the bed and banks of Jones and Oyster Creeks and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

## **ENVIRONMENTAL ANALYSIS**

**Aquatic and Riparian Habitats:** The Applicant's project is located on the Brazos River and portions of Jones and Oyster Creeks, perennial waterbodies. This portion of the Brazos River is in the Floodplains and Low Terraces of the Western Gulf Coast Plain ecoregion (Griffith *et. al.* 2004). Jones and Oyster Creeks are in the Northern Humid Gulf Coastal Prairies of the Western Gulf Coastal Plains ecoregion.

The checklist for the Brazos River Basin identified 91 species of ichthyofauna occurring within the Lower Brazos hydrologic unit (United States Geologic Survey [USGS] code 12070104) (Hendrickson and Cohen 2015). The interior least tern (*Sterna antillarum athalassos*), silver chub (*Macrhybopsis storeriana*), Texas fawnsfoot (*Truncilla macrodon*), and the smooth softshell (*Apalone mutica*), high-interest aquatic species, have been determined to occur in Fort Bend County (TPWD 2015).

The Applicant has agreed to install screens on any new diversion structures in order to minimize entrainment and impingement of aquatic organisms. The Applicant's request is not expected to adversely impact aquatic and riparian habitats in the area.

On February 12, 2014, the TCEQ adopted environmental flow standards for the Brazos River and its associated bay and estuary system (Title 30 Texas Administrative Code (TAC) Chapter 298 Subchapter G). These environmental flow standards are considered adequate to support a sound ecological environment (Title 30 TAC §298.460). The Applicant does not request a new appropriation of water or an amendment that increases the amount of water stored, taken, or diverted. Resource Protection staff recommend a streamflow restriction for the addition of an upstream diversion reach/point(s). Resource Protection staff utilized the subsistence and base environmental flow standards (Title 30 TAC §298.480(18))

established at United States Geological Survey (USGS) Gage No. 08114000 – Brazos River at Richmond, TX for the environmental flow values shown in Table 1.

**Table 1. Environmental Flow Values at USGS Gage No. 08114000 – Brazos River at Richmond, TX.**

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

cfs = cubic feet per second

The applicable subsistence and base flow values depend on the seasons. Seasons are defined in Title 30 TAC § 298.455, as follows: Winter (November through February), Spring (March through June), and Summer (July through October). Resource Protection staff recommend that diversion of water under this proposed amendment be limited to comply with the applicable subsistence and base flow values.

**Recreational Uses:** The Brazos River below Navasota River (Segment 1202) and Upper Oyster Creek (Segment 1245) have designated primary contact recreation 1 uses (TCEQ 2018). The Applicant's request should not adversely impact recreational uses of the segments.

**Water Quality:** The Brazos River below Navasota River (Segment 1202) has a designated high aquatic life use (TCEQ 2018). Upper Oyster Creek (Segment 1245) has designated intermediate aquatic life use (TCEQ 2018).

Segment 1202, the portion of the Brazos River from the confluence with Flat Bank Creek upstream to the confluence with Bessie's Creek in Fort Bend County, is identified in the Texas Integrated Report with a concern for screening levels for chlorophyll-a (TCEQ 2020). Segment 1245, from the confluence with the Brazos River upstream to Dam #3 and from Dam #3 upstream to Harmon Street crossing in Sugar Land, are identified in the Texas Integrated Report with a concern for screening levels for chlorophyll-a. In addition, Segment 1245, from the confluence with the Brazos River upstream to Dam #3, is also identified as non-supporting for bacteria and concerns for screening levels of nitrate and total phosphorous (TCEQ 2020). Further, Segment 1245, from Dam #3 upstream to Harmon Street crossing in Sugar Land, is identified as non-supporting for dissolved oxygen (TCEQ 2020). The Applicant's request should not adversely impact water quality of the segments.

The Applicant is currently authorized an exempt interbasin transfer of Brazos River Basin contract water and surface water to the adjoining San Jacinto-Brazos Coastal Basin for agricultural and industrial purposes. Water from the Brazos River has been historically discharged into Jones and Oyster Creeks for over 35 years. The Applicant's request should not adversely impact water quality in Jones and Oyster Creeks.

**Freshwater Inflows:** Freshwater inflows are critical for maintaining the historical productivity of bays and estuaries along the Gulf Coast. The application does not request a new appropriation of water; therefore, the Applicant's request should not have any impact to the Brazos River's bay and estuary system.

### **RECOMMENDATIONS**

Resource Protection staff recommend the following Special Conditions be included in the proposed amendment, if granted:

1. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens at any new diversion structures.
2. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted, based on the following environmental flow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Special Conditions 3 - 6 below.

<b>Season</b>	<b>Subsistence Flow</b>	<b>Base Flow</b>
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

3. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

4. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The "average adjusted streamflow" at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The "adjusted streamflow" at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
5. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted

streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

6. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**LITERATURE CITED**

Griffith, G.E., S.A. Bryce, J.M. Omernik, J.A. Comstock, A.C. Rogers, B. Harrison, S.L. Hatch, and D. Bezanson. 2004. Ecoregions of Texas. (2-sided color poster with map, descriptive text, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:2,500,000.

Hendrickson DA, Cohen AE. 2015. Fishes of Texas Project Database [Internet]. [2022 January 18]; Version 2.0. Available from <http://www.fishesoftexas.org/home/> doi:10.17603/C3WC70

TCEQ. 2018. Texas Surface Water Quality Standards §§307.1-307.10. Austin (TX): Texas Commission on Environmental Quality.

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George M. Gable IV  
George Gable, Aquatic Scientist

## Hal Bailey

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**From:** Hal Bailey  
**Sent:** Thursday, March 31, 2022 9:22 AM  
**To:** pdonart@gcwatx.gov  
**Cc:** Chris Kozlowski; Brooke McGregor  
**Subject:** Gulf Coast Water Authority Application No. 12-5322G Draft Permit/Notice Applicant Review  
**Attachments:** GCWA\_12-5322G\_Draft\_Permit\_Package\_03.31.2022.pdf

Good morning Mr. Donart,

Attached is the draft amendment/notice package for Gulf Coast Water Authority application no. 12-5322G.

Please review the draft documents and provide any comments and/or edits by COB on 04/14/2022.

If you have any questions, please feel free to let me know.

Thank you,

*Hal E. Bailey, Jr.  
Natural Resources Specialist III  
Water Rights Permitting Team  
Water Availability Division  
Texas Commission on Environmental Quality  
512-239-4615 [Hal.Bailey@tceq.texas.gov](mailto:Hal.Bailey@tceq.texas.gov)*

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

March 31, 2022

Mr. Patrick Donart, P.E., CFM  
Gulf Coast Water Authority  
3630 FM 1765  
Texas City, Texas 77591-4824

**VIA E-MAIL**

RE: Gulf Coast Water Authority  
ADJ 5322  
CN600566152, RN104059472  
Application No. 12-5322G to Amend Certificate of Adjudication No. 12-5322  
Texas Water Code §§ 11.122, 11.085, 11.042, Requiring Mailed and Published Notice  
Brazos River, Jones Creek and Oyster Creek, Brazos River Basin and San Jacinto-Brazos  
Coastal Basin  
Brazoria, Fort Bend, Galveston, and Harris counties

Dear Mr. Donart:

Drafts, subject to revision, of the public notice, proposed amendment to Certificate of Adjudication No. 12-5322, and the related technical memoranda are attached.

Staff is recommending that the referenced application be granted in accordance with the attached drafts. Please review the drafts and contact me no later than April 14, 2022 with any comments or questions as the notice will be forwarded to the Office of the Chief Clerk for mailing after that date.

Please note this application requires a 30-day comment period and once the comment period has closed, the proposed amendment to Certificate of Adjudication No. 12-5322 may be issued as drafted given no hearing requests are received.

If you have any questions concerning the application, please contact me via e-mail at [hal.bailey@tceq.texas.gov](mailto:hal.bailey@tceq.texas.gov) or by telephone at (512) 239-4615.

Sincerely,

A handwritten signature in cursive script that reads "Hal E. Bailey, Jr.".

Hal E. Bailey, Jr., Project Manager  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section

Attachments

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION TO AMEND A CERTIFICATE OF ADJUDICATION

APPLICATION NO. 12-5322G

Gulf Coast Water Authority seeks to amend Certificate of Adjudication No. 12-5322 to add mining purposes of use to all the authorized water, to remove acreage limitations for agricultural use, to authorize the use of three diversion reaches, to authorize use of the bed and banks of Jones and Oyster Creeks to convey water diverted under the certificate, and to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin, and to further amend the certificate to authorize diversion of junior priority water before senior priority water. The application does not request a new appropriation of water. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** Gulf Coast Water Authority, 3630 FM 1765, Texas City, Texas 77591, Applicant, has applied to the Texas Commission on Environmental Quality (TCEQ) to amend Certificate of Adjudication No. 12-5322 pursuant to Texas Water Code (TWC) §§ 11.122, 11.085, 11.042 and TCEQ Rules Title 30 Texas Administrative Code (TAC) §§ 295.1, et seq. Notice is being published and mailed to the water rights holders of record in the Brazos River Basin pursuant to 30 TAC §§ 295.153(b), and mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a).

Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties.

GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

The Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment.

The time priority of the right to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).



The original Certificate issued on January 14, 1988 includes Paragraph 2. USE, which states, *“Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas.”*

Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, *“In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company’s Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner’s service area.”*

GCWA seeks to amend Certificate of Adjudication no. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water, to add a diversion point and to convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County.

The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W within ZIP code 77406.

The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W within ZIP code 77459.

The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W within ZIP code 77583.

GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA’s service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization for use of the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

GCWA further seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2. of the Certificate and Paragraph 1. of Certificate No. 12-5322B to remove the acreage limitations for agricultural use.

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019.

The Executive Director completed the technical review of the application and prepared a draft amendment. The amendment, if granted, would contain special conditions including, but not limited to, streamflow restrictions and maintaining an accounting plan. The application, technical memoranda, and Executive Director’s draft amendment are available for viewing on

the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of the notice. A public meeting is intended for the taking of public comment, and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions for the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering ADJ 5322 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address.

For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322G

TYPE: §§ 11.122, 11.085, 11.042

Owner: Gulf Coast Water Authority

Address: 3630 FM 1765  
Texas City, Texas  
77591

Filed: March 1, 2019

Granted:

Purposes: Municipal, Industrial, Agricultural,  
& Mining

Counties: Harris, Fort Bend,  
Brazoria, & Galveston

Watercourse: Brazos River, Jones Creek, and Oyster  
Creek

Watersheds: Brazos and San Jacinto  
River Basins, and San  
Jacinto-Brazos Coastal  
Basin

WHEREAS, Certificate of Adjudication No. 12-5322 (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert and use not to exceed 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin, at a maximum combined diversion rate of 900 cfs (405,000 gpm) for industrial, municipal, and agricultural purposes to irrigate a maximum of 41,200 acres of land within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties; and

WHEREAS, GCWA is also authorized an exempt interbasin transfer of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin; and

WHEREAS, the Certificate, as amended, contains multiple special conditions, including Paragraph 5 in Certificate of Adjudication No. 12-5322E requiring an accounting plan prior to diversion of water from the point authorized in that amendment; and

WHEREAS, the time priority to divert water from the Brazos River is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and,

WHEREAS, the original Certificate of Adjudication No. 12-5322 issued on January 14, 1988 includes Paragraph 2. USE, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas*"; and

WHEREAS, Certificate of Adjudication No. 12-5322B includes Paragraph 1. USE, which states, *"In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area"*; and

WHEREAS, GCWA seeks to amend Certificate of Adjudication No. 12-5322, as amended, to add mining as a purpose of use for all of the authorized water; and

WHEREAS, GCWA further seeks to add a diversion point and convert all three authorized diversion points to diversion reaches located at diversion facilities owned and operated by GCWA on the Brazos River, Brazos River Basin in Fort Bend County; and

WHEREAS, the upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W; and

WHEREAS, the upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W; and

WHEREAS, GCWA also seeks to authorize an exempt interbasin transfer from the Brazos River Basin to the San Jacinto Basin and the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties; and

WHEREAS, GCWA also seeks to amend the Certificate to authorize use of the bed and banks of Jones and Oyster Creeks for conveyance of water diverted under the Certificate, in accordance with the authorization for use of the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water; and

WHEREAS, GCWA also seeks to amend Certificate of Adjudication No. 12-5322, as amended, to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate of Adjudication No. 12-5322B to remove the acreage limitations for agricultural use; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, GCWA has provided, and the Executive Director has approved the *Water Right Accounting Plan for Gulf Coast Water Authority*; and

WHEREAS, this amendment, if granted, is subject to requirements and orders of the Brazos Watermaster; and

WHEREAS, the Executive Director recommends special conditions be included in this amendment; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322G, is issued to Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to previous authorizations Owner is authorized:

- A. To convey water to and through the bed and banks of Jones and Oyster Creeks, in accordance with the authorization to use the bed and banks of Jones and Oyster Creeks in Certificate of Adjudication No. 12-5168, as amended, for municipal, industrial, mining, and agricultural purposes in Harris, Fort Bend, Brazoria, and Galveston counties.
- B. To use the authorized 155,000 acre-feet of water per year for mining purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties.
- C. To use the authorized 155,000 acre-feet of water per year for agricultural purposes within the Owner's service area in Harris, Fort Bend, Brazoria, and Galveston counties without limitation on the acreage to be irrigated.
- D. An exempt interbasin transfer within Owner's service area for all authorized purposes of use and for contract water to those portions of Harris, Fort Bend, Brazoria, and Galveston counties within the San Jacinto River Basin and the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

- A. In lieu of the previous authorizations, Owner is authorized to divert from three diversion reaches located at diversion facilities owned and operated by Owner on the Brazos River in Fort Bend County:
  1. The upstream boundary of Diversion Reach No. 1 is located at Latitude 29.646223° N, Longitude 95.902478° W and the downstream boundary is located at Latitude 29.639858° N, Longitude 95.902208° W.
  2. The upstream boundary of Diversion Reach No. 2 is located at Latitude 29.504152° N, Longitude 95.554569° W and the downstream boundary is located at Latitude 29.502976° N, Longitude 95.552743° W.
  3. The upstream boundary of Diversion Reach No. 3 is located at Latitude 29.458278° N, Longitude 95.532664° W and the downstream boundary is located at Latitude 29.455055° N, Longitude 95.533160° W.
- B. Maximum combined diversion rate of not to exceed 900 cfs (405,000 gpm).

3. PRIORITY DATE

The time priority of the right to divert water from the Brazos River is February 8, 1929 for the first 40,000 acre-feet of water at 400 cfs (180,000 gpm), March 14, 1955 for the next

40,000 acre-feet of water at 668 cfs (300,600 gpm), and July 25, 1983 for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).

#### 4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.

#### 5. SPECIAL CONDITIONS

- A. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens at any new diversion structures.
- B. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted based on the following streamflow values at USGS Gage No. 08114000 - Brazos River at Richmond, TX, as set forth in Paragraphs 6.C. - 6.F. below.

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

- C. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

- D. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 - Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The "average adjusted streamflow" at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The "adjusted streamflow" at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
- E. If average adjusted streamflow at USGS Gage No. 08114000 - Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted streamflow at the gage and

the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

- F. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.
- G. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1982 prior to diverting up to 40,000 acre-feet per year with a time priority of March 14, 1955, and/or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any requirements and orders of the Brazos Watermaster.
- H. Diversion of water diverted from the Brazos River and discharged into Jones and Oyster Creeks shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones Creek less calculated losses.
- I. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- J. Owner shall install and maintain a measuring device, approved by the Brazos Watermaster, at any new diversion structures, which accounts for, within 5% accuracy, the quantity of water diverted from any new diversion points within the reaches authorized in Paragraph 2. DIVERSION.
- K. Owner shall allow representatives of the Brazos Watermaster reasonable access to the property to inspect the measuring device and records.
- L. Owner shall contact the Brazos Watermaster prior to diversion of water from the Brazos River authorized by this amendment.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos and San Jacinto River Basins and the San Jacinto-Brazos Coastal Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

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For the Commission

Date Issued:



**Texas Commission on Environmental Quality**

INTEROFFICE MEMORANDUM

To: Hal Bailey, Project Manager  
Water Rights Permitting Team

Date: February 17, 2022

Through: KA Kathy Alexander, Ph.D., Policy and Technical Analyst  
Water Availability Division

TG Trent Gay, Team Leader  
Surface Water Availability Team

From: Steven Mahr, Hydrologist  
Surface Water Availability Team

Subject: Gulf Coast Water Authority  
ADJ 5322  
CN600566152  
Brazos River, Brazos River Basin  
Brazoria, Fort Bend, Galveston, Harris counties

**WATER AVAILABILITY REVIEW**

**Application Summary**

Certificate of Adjudication No. 12-5322G (Certificate) authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin for industrial, municipal, and agricultural purposes within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties. GCWA is further authorized an exempt interbasin transfer (IBT) of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural purposes.

The Certificate includes Paragraph 2, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*"

Certificate No. 12-5322B includes Paragraph 1, which states, "*In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area.*"

GCWA requests to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B to remove the acreage limitations for agricultural use. In addition, GCWA requests to amend the Certificate to add mining use to all the authorized water, to add a diversion point, to convert all three authorized diversion points to diversion reaches, and to authorize an exempt IBT from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also requests authorization to use the bed and banks of Jones and Oyster Creeks and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

GCWA submitted an accounting plan to track diversions of water authorized under this Certificate, in combination with Certificate Nos. 12-5168 and 12-5171 held by the owner, according to priority date and source.

The application was declared administratively complete on March 1, 2019.

### **Water Availability Review and No Injury Analysis**

Resource Protection staff recommend that the application be subject to instream flow requirements. Specific instream flow requirements are included in Resource Protection staff's January 21, 2022 memorandum.

The application does not request a new appropriation of water; therefore, a water availability analysis is not necessary. However, the requests to add a diversion point, modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B, add a bed and banks authorization, add purposes of use to an existing IBT, and to authorize diversion of junior priority water before senior priority water must be reviewed to ensure that no water rights are affected by the requests.

The Water Rights Analysis Package (WRAP) simulates management of the water resources of a river basin. TCEQ uses WRAP in the evaluation of water right permit applications using priority-based water allocations. WRAP is a generalized simulation model for application to any river basin, and input datasets must be developed for the particular river basin of concern. The TCEQ developed water availability models (WAMs) for Texas river basins that include geographical information, water right information, naturalized flows, evaporation rates, channel losses, and specific management assumptions. Hydrology staff operates WRAP to evaluate water rights applications to determine water availability and to ensure that senior water rights are protected.

Staff used the Full Authorization simulation of the Brazos River WAM, where all water rights use their maximum authorized amount and return flows are not included, to evaluate impacts on other water rights as a result of converting the diversion points to diversion reaches and diverting the authorized water at the requested upstream diversion location. The period of record for the Brazos River WAM is 1940 to 2018.

Staff first modeled the application at the two existing diversion points such that diversions are taken first at the upstream point and any remaining diversions are taken at the downstream point. Staff then added the proposed additional upstream diversion point (the most upstream point) and modeled the application such that diversions are taken at the three points in upstream to downstream succession with the recommended environmental flow restrictions applied at the additional upstream point. For modeling purposes, Staff used the existing and proposed diversion points to represent the proposed reaches. Staff believes that this representation is appropriate because no other water rights fall within the proposed reaches, and the reaches encompass the existing and proposed diversion points. Staff compared the pre- and post-application volume reliabilities for all basin water rights and found negative impacts to 39 water rights, or portions of those water rights, ranging from -0.01% to -0.29% with an average impact of -0.08%. Staff notes that no municipal water rights that were 100 per cent reliable in the pre-application simulation were reduced in the post-application simulation. Staff is of the opinion that the application will not have an effect on other water rights in the basin.

Regarding the request to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B, which include specific requirements regarding the amount and acreage location for irrigation diversions, GCWA's application indicates that the limitations are no longer applicable because of the nature of their wholesale operations. Additionally, the application requests to add mining use to all authorized water and to add additional purposes of use to the existing IBT for all authorized water. Staff reviewed the application materials and agrees that Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B contain language that is no longer applicable.

Regarding the request to add additional purposes of use to an existing exempt IBT to the San Jacinto-Brazos Coastal Basin, reviews of requests for IBTs are conducted in accordance with Chapter §11.085 of the Texas Water Code (TWC) and TCEQ rules regarding IBTs. GCWA's request for an IBT is exempt under TWC §11.085(v)(3) and (v)(4). Therefore, staff did not perform a review under TWC §11.085.

Regarding the request use the bed and banks of Jones and Oyster Creeks to convey water diverted from the Brazos River, the application included the information required in 30 TAC §295.113. Based on a February 1999 report titled Water Audit and Water Use Projections, GCWA has estimated that conveyance losses will be approximately 20% of the discharged volume over the 75 mile extent of the of the American canal system, including the 42 mile portion of the Jones and Oyster Creeks conveyance reaches. Staff evaluated the estimated losses and found them adequate.

Regarding GCWA's request to authorize diversion of junior water before more senior water, staff notes that the Certificate includes priority dates for diversion of water from the Brazos River of February 8, 1929, March 14, 1955 and July 25, 1983. TCEQ's rules (30 TAC §297.58(b), Accounting Water Use) provide that if a water right has appropriations with different priority dates, the oldest priority water shall be credited against the water first used unless the water right expressly provides otherwise. GCWA's diversions from the Brazos River are subject to the requirements and orders of the Brazos Watermaster. Water right holders in a Watermaster area are required to notify the Watermaster prior to diversion, and the Watermaster tracks the amount of water used at each priority date. The Brazos Watermaster actively manages water rights on a daily basis and protects senior water rights in times of shortage. GCWA has submitted an accounting plan that accounts for diversions at all priority dates and locations, including the new diversion points. Staff's opinion is that this request will not impact other water rights.

GCWA submitted an accounting plan (*Water Right Accounting Plan for Gulf Coast Water Authority*) that accounts for diversions at the new diversion points, as requested in this application, in combination with two concurrent applications by GCWA (Application Nos. 12-5168C and 12-5171B). Staff reviewed the accounting plan and found it adequate to demonstrate compliance with the terms and conditions of the proposed amendment.

## Conclusion

Staff is of the opinion that if GCWA manages diversions in accordance with the approved accounting plan and the requirements of the Brazos Watermaster, the application will not affect existing water rights. Therefore, Hydrology staff can support granting the application.

Staff recommends that the following special conditions be included in the amendment:

1. Owner is authorized to divert from the Brazos River up to 75,000 acre-feet per year with a time priority of July 25, 1982 prior to diverting up to 40,000 acre-feet per year with a

time priority of March 14, 1955, or prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is also authorized to divert from the Brazos River up to 40,000 acre-feet per year with a time priority of March 14, 1955 prior to diverting up to 40,000 acre-feet per year with a time priority of February 8, 1929. Owner is authorized to account for water used under each authorized priority date at Owner's discretion, in accordance with the terms and conditions of this amendment, including the most recently approved accounting plan, and subject to any requirements and orders of the Brazos Watermaster.

2. Diversion of water diverted from the Brazos River and discharged into Jones and Oyster Creeks shall not occur at rates or in amounts higher than the actual daily amount of water discharged into Jones Creek less calculated losses.
3. Owner shall only divert water authorized under this amendment pursuant to Paragraph 1. USE and Paragraph 2. DIVERSION in accordance with the most recently approved *Water Right Accounting Plan for Gulf Coast Water Authority*. Owner shall maintain the plan in electronic format and make it available upon request. Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the Certificate terms must be in the form of an amendment to the Certificate. Should Owner fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Owner shall immediately cease diversion of water to the extent such diversions are authorized in this amendment, and either apply to amend the Certificate, or voluntarily forfeit the amendment. If Owner fails to amend the accounting plan or forfeit the amendment, the Commission may begin proceedings to cancel the amendment. Owner shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.

*Steven Mahr*

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Steven Mahr, Hydrologist

# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

**To:** Hal Bailey, Project Manager  
Water Rights Permitting Team

**Date:** January 21, 2022

**Through:** Leslie Patterson, Team Leader  
Resource Protection Team



Kristin Wang, Senior Water Conservation Specialist  
Resource Protection Team

**From:** Jennifer Allis, Senior Water Conservation Specialist  
Resource Protection Team

**Subject:** Gulf Coast Water Authority  
ADJ 5322  
CN600566152  
Brazos River, Brazos River Basin  
Fort Bend County

### APPLICATION SUMMARY

Certificate of Adjudication No. 12-5322 (Certificate), as amended, authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin for industrial, municipal, and agricultural purposes within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties. GCWA is further authorized an exempt interbasin transfer (IBT) of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural purposes.

The original Certificate includes Paragraph 2, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*"

Certificate No. 12-5322B includes Paragraph 1, which states, "*In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area.*"

GCWA requests to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B to remove the acreage limitations for agricultural use. In addition, GCWA requests to amend the Certificate to add mining use to all the authorized water, to add a diversion point, to convert all three authorized diversion points to diversion reaches, and to authorize an exempt IBT from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also requests authorization to use the bed and banks of Jones and Oyster Creeks and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

### **WATER CONSERVATION REVIEW**

Pursuant to Title 30 Texas Administrative Code (TAC) §295.9(4), applications requesting to change the place and/or purpose of use require the submittal of water conservation and drought contingency plans.

As a wholesale water supplier, GCWA submitted water conservation and drought contingency plans. Resource Protection staff reviewed the water conservation and drought contingency plans and found that the plans meet the requirements in 30 TAC §§ 288.5 and 288.22.

The application is consistent with the 2021 Region H Water Plan and the 2022 State Water Plan because there is nothing in the water plans that conflicts with issuing this proposed amendment.

### **RECOMMENDATIONS**

The following water conservation language should be included in the proposed amendment, if granted:

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.



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Jennifer Allis, Senior Water Conservation Specialist

# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

To: Hal Bailey, Project Manager  
Water Rights Permitting Team

Through: Leslie Patterson, Team Leader  
 Resource Protection Team

From: George Gable, Aquatic Scientist  
Resource Protection Team

Subject: Gulf Coast Water Authority  
ADJ 5322  
CN600566152  
Brazos River, Brazos River Basin  
Fort Bend County

Date: January 21, 2022

Environmental reviews of water right applications are conducted in accordance with applicable provisions of the Texas Water Code (TWC) and the administrative rules of the Texas Commission on Environmental Quality (TCEQ). The provisions applicable to environmental reviews can vary according to the type and the location of the authorization requested.

### APPLICATION SUMMARY

Certificate of Adjudication No. 12-5322 (Certificate), as amended, authorizes Gulf Coast Water Authority (GCWA/Owner) to, among other things, divert 155,000 acre-feet of water per year from two points on the Brazos River, Brazos River Basin for industrial, municipal, and agricultural purposes within GCWA's service area in Fort Bend, Brazoria, Galveston and Harris counties. GCWA is further authorized an exempt interbasin transfer (IBT) of water authorized by the Certificate and for contract water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural purposes.

The original Certificate includes Paragraph 2, which states, "*Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*"

Certificate No. 12-5322B includes Paragraph 1, which states, "*In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended: Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of*

*land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and Owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the Owner's service area."*

GCWA requests to modify Paragraph 2 of the Certificate and Paragraph 1 of Certificate No. 12-5322B to remove the acreage limitations for agricultural use. In addition, GCWA requests to amend the Certificate to add mining use to all the authorized water, to add a diversion point, to convert all three authorized diversion points to diversion reaches, and to authorize an exempt IBT from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for all authorized purposes of use and for contract water for use within GCWA's service area in Harris, Fort Bend, Brazoria, and Galveston counties.

GCWA also requests authorization to use the bed and banks of Jones and Oyster Creeks and to further amend the Certificate to allow GCWA to divert junior priority water before senior priority water.

## **ENVIRONMENTAL ANALYSIS**

**Aquatic and Riparian Habitats:** The Applicant's project is located on the Brazos River and portions of Jones and Oyster Creeks, perennial waterbodies. This portion of the Brazos River is in the Floodplains and Low Terraces of the Western Gulf Coast Plain ecoregion (Griffith *et. al.* 2004). Jones and Oyster Creeks are in the Northern Humid Gulf Coastal Prairies of the Western Gulf Coastal Plains ecoregion.

The checklist for the Brazos River Basin identified 91 species of ichthyofauna occurring within the Lower Brazos hydrologic unit (United States Geologic Survey [USGS] code 12070104) (Hendrickson and Cohen 2015). The interior least tern (*Sterna antillarum athalassos*), silver chub (*Macrhybopsis storeriana*), Texas fawnsfoot (*Truncilla macrodon*), and the smooth softshell (*Apalone mutica*), high-interest aquatic species, have been determined to occur in Fort Bend County (TPWD 2015).

The Applicant has agreed to install screens on any new diversion structures in order to minimize entrainment and impingement of aquatic organisms. The Applicant's request is not expected to adversely impact aquatic and riparian habitats in the area.

On February 12, 2014, the TCEQ adopted environmental flow standards for the Brazos River and its associated bay and estuary system (Title 30 Texas Administrative Code (TAC) Chapter 298 Subchapter G). These environmental flow standards are considered adequate to support a sound ecological environment (Title 30 TAC §298.460). The Applicant does not request a new appropriation of water or an amendment that increases the amount of water stored, taken, or diverted. Resource Protection staff recommend a streamflow restriction for the addition of an upstream diversion reach/point(s). Resource Protection staff utilized the subsistence and base environmental flow standards (Title 30 TAC §298.480(18))



established at United States Geological Survey (USGS) Gage No. 08114000 – Brazos River at Richmond, TX for the environmental flow values shown in Table 1.

**Table 1. Environmental Flow Values at USGS Gage No. 08114000 – Brazos River at Richmond, TX.**

Season	Subsistence Flow	Base Flow
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

cfs = cubic feet per second

The applicable subsistence and base flow values depend on the seasons. Seasons are defined in Title 30 TAC § 298.455, as follows: Winter (November through February), Spring (March through June), and Summer (July through October). Resource Protection staff recommend that diversion of water under this proposed amendment be limited to comply with the applicable subsistence and base flow values.

**Recreational Uses:** The Brazos River below Navasota River (Segment 1202) and Upper Oyster Creek (Segment 1245) have designated primary contact recreation 1 uses (TCEQ 2018). The Applicant's request should not adversely impact recreational uses of the segments.

**Water Quality:** The Brazos River below Navasota River (Segment 1202) has a designated high aquatic life use (TCEQ 2018). Upper Oyster Creek (Segment 1245) has designated intermediate aquatic life use (TCEQ 2018).

Segment 1202, the portion of the Brazos River from the confluence with Flat Bank Creek upstream to the confluence with Bessie's Creek in Fort Bend County, is identified in the Texas Integrated Report with a concern for screening levels for chlorophyll-a (TCEQ 2020). Segment 1245, from the confluence with the Brazos River upstream to Dam #3 and from Dam #3 upstream to Harmon Street crossing in Sugar Land, are identified in the Texas Integrated Report with a concern for screening levels for chlorophyll-a. In addition, Segment 1245, from the confluence with the Brazos River upstream to Dam #3, is also identified as non-supporting for bacteria and concerns for screening levels of nitrate and total phosphorous (TCEQ 2020). Further, Segment 1245, from Dam #3 upstream to Harmon Street crossing in Sugar Land, is identified as non-supporting for dissolved oxygen (TCEQ 2020). The Applicant's request should not adversely impact water quality of the segments.

The Applicant is currently authorized an exempt interbasin transfer of Brazos River Basin contract water and surface water to the adjoining San Jacinto-Brazos Coastal Basin for agricultural and industrial purposes. Water from the Brazos River has been historically discharged into Jones and Oyster Creeks for over 35 years. The Applicant's request should not adversely impact water quality in Jones and Oyster Creeks.

**Freshwater Inflows:** Freshwater inflows are critical for maintaining the historical productivity of bays and estuaries along the Gulf Coast. The application does not request a new appropriation of water; therefore, the Applicant's request should not have any impact to the Brazos River's bay and estuary system.

### **RECOMMENDATIONS**

Resource Protection staff recommend the following Special Conditions be included in the proposed amendment, if granted:

1. Owner shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens at any new diversion structures.
2. Diversions of water at diversion points in Diversion Reach No. 1 shall be restricted, based on the following environmental flow values at USGS Gage No. 08114000 – Brazos River at Richmond, TX, as set forth in Special Conditions 3 - 6 below.

<b>Season</b>	<b>Subsistence Flow</b>	<b>Base Flow</b>
Winter	550 cfs	990 cfs
Spring	550 cfs	1,190 cfs
Summer	550 cfs	930 cfs

3. Seasons are defined as follows: Winter (November through February), Spring (March through June), Summer (July through October).

#### **Subsistence Flow Special Conditions and 50% rule**

4. Owner shall not divert water at diversion points in Diversion Reach No. 1 if the average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is less than or equal to the applicable subsistence flow. The "average adjusted streamflow" at the gage is the average of adjusted streamflows measured at the gage for the previous 24 hours. The "adjusted streamflow" at the gage at any time is the measured streamflow that would occur at the gage at that time in the absence of any diversions by Owner. Unless informed otherwise by the Brazos Watermaster, Owner may assume that under all conditions, measured streamflow plus the rate at which water is being diverted at that time by Owner under this water right equals adjusted streamflow.
5. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable subsistence flow but less than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable subsistence flow plus 50% of the difference between average adjusted

streamflow at the gage and the applicable subsistence flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**Base Flow Special Condition**

6. If average adjusted streamflow at USGS Gage No. 08114000 – Brazos River at Richmond, TX is greater than the applicable base flow, Owner shall not divert water at diversion points in Diversion Reach No. 1 in excess of the rate that would reduce average streamflow at the gage to the applicable base flow; provided, however, Owner is not required to adjust its diversion rate more frequently than once every 24 hours.

**LITERATURE CITED**

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George M. Gable IV  
George Gable, Aquatic Scientist

## Hal Bailey

---

**From:** Humberto Galvan  
**Sent:** Friday, February 25, 2022 8:41 AM  
**To:** Chris Kozlowski  
**Cc:** Hal Bailey; Molly Mohler  
**Subject:** FW: Change in GCWA Contact  
**Attachments:** GCWA Change in Priamry Contact.pdf

FYI

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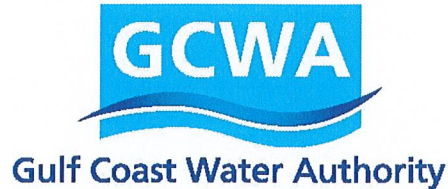
**From:** David Sauer <dsauer@gcwatx.gov>  
**Sent:** Friday, February 25, 2022 8:31 AM  
**To:** Humberto Galvan <Humberto.Galvan@tceq.texas.gov>  
**Cc:** Williams, Paulina <paulina.williams@bakerbotts.com>; Brandon Wade <Bwade@gcwatx.gov>; Patrick Donart <Pdonart@gcwatx.gov>  
**Subject:** Change in GCWA Contact

Bert,

Attached is a letter changing the primary contact for GCWA relating to the application amendment for 12-5168C, 12-5171B and 12-5322G. I will be retiring on February 28<sup>th</sup>. The attached letter outlines the changes.

Thanks

David Sauer  
Gulf Coast Water Authority  
Assistant General Manager  
1500 West Highway 6  
Alvin, Texas 77511  
Cell: 281-932-1039  
[dsauer@gcwater.org](mailto:dsauer@gcwater.org)



---

3630 FM 1765

Texas City, Texas 77591

409.935.2438

fax 409.935.4156

February 24, 2022

Mr. Bert Galvan, Work Leader  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section

Re: Change in Primary Contact

Dear Bert:

I will be retiring from Gulf Coast Water Authority (GCWA) on Monday, February 28, 2022. I became the new contact person regarding amendment applications (12-5168C, 12-5171B & 12-5322G) for GCWA through an email notification to you dated February 23, 2021. The primary contact for GCWA moving forward will be:

Patrick Donart, P.E., CFM  
District Engineer  
Gulf Coast Water Authority  
3630 FM 1765, Texas City, TX 77591  
409.795.0745 mobile  
pdonart@gcwatx.gov

It has been a pleasure working with you in the past. Please send all future correspondence that you want to send directly to GCWA to Patrick. GCWA continues to work with Baker Botts and Freese & Nichols and those contacts remain unchanged. Should you have any questions please let me know. I can be reached at 281-932-1039.

Sincerely,

A handwritten signature in blue ink, appearing to read "David Sauer", is written over a light blue horizontal line.

David Sauer  
Assistant General Manager  
Gulf Coast Water Authority

Cc: Brandon Wade - GCWA  
Paulina Williams - Baker Botts  
Patrick Donart - GCWA

**From:** [Williams, Paulina](#)  
**To:** [Humberto Galvan](#)  
**Cc:** [David Sauer \(dsauer@gcwater.org\)](mailto:dsauer@gcwater.org)  
**Subject:** RE: GCWA App Nos. 12-5168C, 12-5171B, & 12-5322G  
**Date:** Tuesday, February 23, 2021 5:00:37 PM

---

Good afternoon,  
The new contact is for the reference applications is:  
David Sauer  
GCWA, Assistant General Manager  
3630 FM 1765  
Texas City, Texas 77591  
[dsauer@gcwater.org](mailto:dsauer@gcwater.org)  
281-331-3137

Let us know if there are any other questions. Thanks so much.

Paulina  
**Paulina Williams**  
512.322.2543 - Direct  
512.322.3643 - Fax  
[paulina.williams@bakerbotts.com](mailto:paulina.williams@bakerbotts.com)  
Baker Botts L.L.P.  
98 San Jacinto Blvd.  
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Austin, Texas 78701

---

**From:** Humberto Galvan <[Humberto.Galvan@tceq.texas.gov](mailto:Humberto.Galvan@tceq.texas.gov)>  
**Sent:** Tuesday, February 23, 2021 12:30 PM  
**To:** Williams, Paulina <[paulina.williams@bakerbotts.com](mailto:paulina.williams@bakerbotts.com)>  
**Subject:** GCWA App Nos. 12-5168C, 12-5171B, & 12-5322G

**[EXTERNAL EMAIL]**

Ms. Williams,

I was just made aware that Mr. Ivan Langford is leaving the Gulf Cust Water Authority and he is listed as the current contact for the amendment applications (12-5168C, 12-5171B, & 12-5322G), can you please provide us the new contact information for theses applications.

Best regards,  
Bert Galvan, Work Leader  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section  
(512) 239-4013

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**From:** [Humberto Galvan](#)  
**To:** [Humberto Galvan](#)  
**Subject:** FW: GCWA applications  
**Date:** Friday, February 12, 2021 12:31:12 PM  
**Attachments:** [Water Right Accounting Plan SyntheticTestData 20210127.xlsm](#)  
[Water Right Accounting Plan Blank 20210127.xlsm](#)  
[GCWA Accounting Plan Report 20210128.pdf](#)

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**From:** Philip Taucer <[Philip.Taucer@freese.com](mailto:Philip.Taucer@freese.com)>  
**Sent:** Thursday, January 28, 2021 9:25 AM  
**To:** Kathy Alexander <[kathy.alexander@tceq.texas.gov](mailto:kathy.alexander@tceq.texas.gov)>  
**Cc:** Brooke McGregor <[brooke.mcgregor@tceq.texas.gov](mailto:brooke.mcgregor@tceq.texas.gov)>; Brandon Wade <[Bwade@gcwater.org](mailto:Bwade@gcwater.org)>; [dsauer@gcwater.org](mailto:dsauer@gcwater.org); Jon Albright <[JSA@freese.com](mailto:JSA@freese.com)>  
**Subject:** RE: GCWA applications

Kathy,

Following up on our recent discussion of GCWA's applications for water right amendments, attached please find an updated GCWA Accounting Plan workbook integrating TCEQ's recommended streamflow special conditions. The workbook is included in both pre-populated (synthetic test data) and blank forms. Also attached is a revised Accounting Plan documentation report, which has been updated to reflect the workbook modifications, improve clarity, and address minor comments from TCEQ's review of the original report. If you have any questions or would like to discuss the details of how the changes were integrated into the workbook, please let me know and I would be happy to set up a call to discuss. Thanks.

-Philip

**Philip I. Taucer, P.E.**  
Water Resources

**Freese and Nichols, Inc.**  
10497 Town and Country Way, Suite 500  
Houston, Texas 77024  
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# WATER RIGHT ACCOUNTING PLAN

Prepared for:

**Gulf Coast Water Authority**



Prepared by:

**FREESE AND NICHOLS, INC.**  
10497 Town and Country Way, Suite 500  
Houston, TX 77024  
713-600-6800

[ver. 01/27/2021]

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## **ACRONYMS AND ABBREVIATIONS**

BRA	Brazos River Authority
CoA	Certificate of Adjudication
GCWA	Gulf Coast Water Authority
PHDI	Palmer Hydrologic Drought Index
SB3	Senate Bill 3
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
USGS	United States Geological Survey

## **UNITS**

ac-ft	acre-feet
ac-ft/yr	acre-feet/year
cfs	cubic feet/second

## 1. INTRODUCTION

Gulf Coast Water Authority (GCWA), as required by permit 12-5322E (issued by TCEQ on January 7, 2011) and as part of an ongoing process to pursue more flexible utilization of its Brazos River water supplies, has developed an Accounting Plan (GCWA Accounting Plan) to facilitate tracking of its diversions from the Brazos River. The Accounting Plan reflects both current authorizations and pending amendments to existing water rights. This Accounting Plan also reflects GCWA's authorization, pursuant to its water rights and pending amendments, to elect to credit water use against any portion of GCWA's water rights, in any priority order, at the GCWA's discretion, subject to availability, priority calls<sup>1</sup>, environmental flow requirements, and other permit conditions. The Accounting Plan, once approved by the Texas Commission on Environmental Quality (TCEQ), will be maintained in an electronic format and made available to the public and the Executive Director of the TCEQ upon request. Any future modifications to the Accounting Plan must be approved by TCEQ. Flow parameters, water right authorizations, contractual authorizations, and Accounting Plan workbook operation for the proposed Accounting Plan workbook are discussed in greater detail in the following sections.

## 2. GCWA BRAZOS RIVER SUPPLY OVERVIEW

### 2.1 GCWA WATER RIGHTS

GCWA holds three water rights on the Brazos River: Certificates of Adjudication (CoA) 12-5168, 12-5171, and 12-5322. While the Accounting Plan is designed to accommodate currently pending amendments to these rights that will allow all three rights to be used for any authorized purpose at any of GCWA's authorized Brazos River diversion locations, it is assumed that certain key parameters of the water rights, such as authorized annual diversion amounts, priority dates, and maximum diversion rates will not change. Key water rights parameters that are incorporated into the Accounting Plan are summarized in **Table 2-1**.

---

<sup>1</sup> In a basin with a Watermaster, such as this portion of the Brazos River, priority calls directly from downstream senior water rights holders are not likely to occur. The term "priority call," as used in this report is therefore also intended to refer to the Watermaster's advance communication to GCWA that water at a specific priority date is needed downstream to meet a senior need, as documented through a Declaration of Intent to Divert.

**Table 2-1: GCWA Brazos River Water Rights**

Right	Priority Date	Annual Volume (ac-ft)	Maximum Rate (cfs)	
12-5168	1/15/1926	99,932	685	
12-5171	12/12/1950	50,000	600	600*
	2/1/1939	75,000	600	
12-5322	7/25/1983	75,000	900	900*
	3/14/1955	40,000	668	
	2/8/1929	40,000	400	

\*Combined rate for full Certificate of Adjudication.

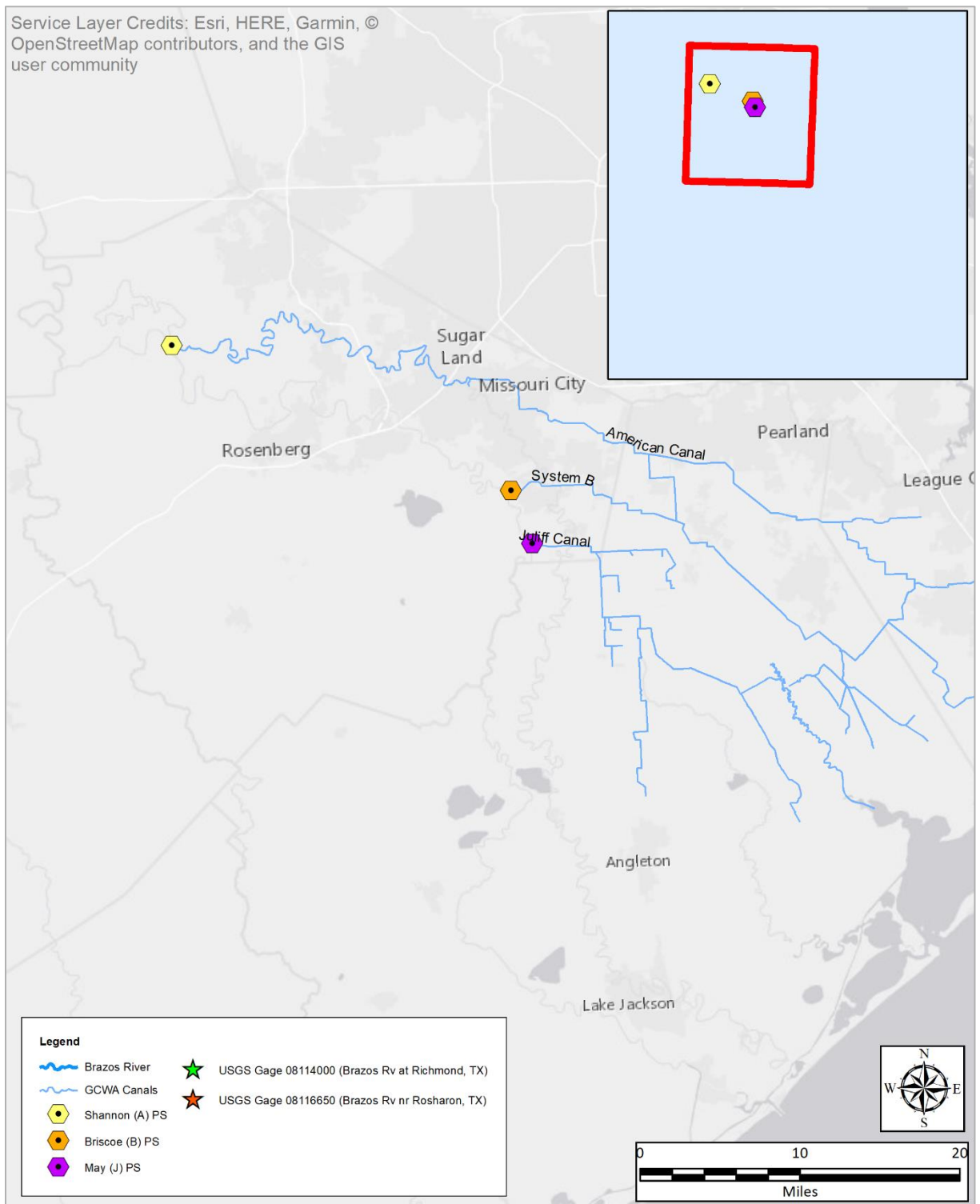
## 2.2 CONTRACTUAL SUPPLIES TO GCWA

GCWA has entered into a number of contracts to receive additional surface water supply, including contracts with the Brazos River Authority (BRA). Through these contracts, GCWA has access to additional water supplies that may be diverted by GCWA downstream at its Brazos River take points. The number and volume of these contracts may change over time. GCWA also has the ability to divert water from the Brazos River contracted to various other entities through assignment by those entities to GCWA or through other mechanisms. The number and volume of these contracts may change over time.

## 2.3 GCWA TAKE POINTS

GCWA operates three take points on the Brazos River, as shown in **Figure 2-1**. Take point A (Shannon pump station) is located slightly south of the City of Fulshear and diverts flows into GCWA's American Canal. Take point B (Briscoe pump station) is located downstream near the Sienna Plantation community and diverts water into the Briscoe Canal. Take point J (May pump station) is slightly downstream of point B and diverts water into the Juliff Canal. Water diverted from the Brazos River by GCWA is authorized and currently diverted for use in the San Jacinto-Brazos Coastal Basin.

**Figure 2-1: GCWA Brazos River Take Points**





### **3. ELEMENTS OF THE ACCOUNTING PLAN**

The Accounting Plan is designed to track diversions from the Brazos River while meeting TCEQ requirements. Major elements of the Accounting Plan include mechanisms to verify compliance with SB3 environmental flow requirements, tracking of priority calls, and compilation of summary data for water right reporting. The Accounting Plan workbook can also handle unusual situations such as priority calls. The Accounting Plan workbook structure is discussed in detail in the following sections.

#### **3.1 WORKBOOK OVERVIEW**

The Accounting Plan workbook has been designed for streamlined usability by providing dedicated tabs for data entry, calculations, and summarization. Columns have been given descriptive names and include identifiers for units and to differentiate inputs and calculations. Where practicable, columns are arranged to minimize the need for the user or reviewer to move frequently among tabs, and long or complex calculations have been broken down into multiple logical steps to make them easier to understand.

Shading has been applied within the Accounting Plan workbook to assist the user in recognizing the function of certain cells. Yellow shading identifies a location for regular user input. Manual overrides of calculated values or raw inputs are shown in gray. White (unshaded) cells contain automatic calculations.

In addition to the regular cell shading described above, the Accounting Plan also applies visual cues to differentiate cells and columns intended for input, overrides, and calculations as well as indication of potential data entry issues. For example, cells associated with water right priority calls are shaded blue when a call is in place. Red shading is used to identify potential data entry errors and assist the user in finding the location and cause of the error. Warnings of potential issues are designed to be visually distinct and are generally reflected in both the tab where the potential issue occurs and on the summary panel.

#### **3.2 WORKBOOK INTEGRITY AND ACCESSIBILITY**

In order to prevent inadvertent modification of calculations, the tabs within the workbook have been locked to limit the user to modifying the contents of cells used for inputs or overrides. This feature has been configured to allow the user to retain the ability to copy the values in any cells, input or otherwise, for export to other documents. If it is necessary to copy or examine formulas, the user may disable the protection on one or more tabs using the password “gcwa”. It is highly recommended that sheet protection be maintained.

Also, it should be noted that a limited number of calculations within the workbook rely upon a custom function which is not native to Microsoft Excel. This function will not work in all potential Microsoft Excel file formats. When saving a copy of the workbook, the user should use a macro-enabled format such as .xlsm or .xlsb.

### 3.3 WORKBOOK TABS

The Accounting Plan workbook contains the following tabs for data entry, calculations, summary of results, and reference data. Each of these tabs is described in greater detail in subsequent sections of this document.

- **Intro** – Introductory tab providing links to the other tabs as well as a key to the major cell shading conventions applied in the workbook.
- **Tab 1 (Summary of Results)** – Includes a condensed overview of cumulative usage of GCWA water rights, diversion rates, remaining diversions requiring allocation by the user, and notification of potential conflicts or data entry issues.
- **Tab 2 (Input Data Sheet for Basic Data)** – Provides a location for inputs related to priority water right calls and stream flow measurements. For purposes of the Accounting Plan, the term “priority call” is also intended to include the Watermaster’s advance communication to GCWA that water at a specific priority date is needed downstream to meet a senior need, as documented through a Declaration of Intent to Divert.
- **Tab 3 (Input Data Sheet for Diversion Location A)** – Serves as the location for input of diversions from the Brazos River at Location A (Shannon) as well as assignment of this volume against portions of GCWA water rights or other sources accessible by GCWA. The tab also provides indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, environmental flow requirements, or other factors.
- **Tab 4 (Input Data Sheet for Diversion Location B)** – Serves as the location for input of diversions from the Brazos River at Location B (Briscoe) as well as assignment of this volume against portions of GCWA water rights or other sources accessible by GCWA. The tab also provides indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, or other factors.

- **Tab 5 (Input Data Sheet for Diversion Location J)** – Serves as the location for input of diversions from the Brazos River at Location J (Juliff) as well as assignment of this volume against portions of GCWA water rights or other sources accessible by GCWA. The tab also provides indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, environmental flow requirements, or other factors.
- **Tab 6 (Summary of Diversions by Source and Location)** – Summarizes monthly diversions by water right and diversion location, as well as diversions counted against other sources accessible by GCWA.
- **Tab 7 (Water Rights Reporting)** – Presents the monthly diversions by water right from Tab 6 in a more condensed form without reference to diversion location.
- **Tab 8 (Daily Computations for Run-of-River Rights)** – Acts as the primary location for calculations related to GCWA run-of-river water right accessibility, including tracking of cumulative and remaining supplies by right and priority. The tab also examines other factors which could impact daily accessibility of an authorization, including priority calls, permitted diversion rates, and environmental flows. The calculations on this tab are referenced on Tabs 3 – 5 to provide the user with an indicator of whether or not a particular appropriation is usable each day.
- **Tab 9 (Instream Flow Computations for Richmond Gage)** – Tracks attainment of SB3 environmental flows requirements for the gaging station USGS 08114000 (Brazos Rv at Richmond, TX). This tab is used by Tabs 3 and 8 as part of the logic to determine daily accessibility of CoA 12-5322 at Location A.
- **Tab 10 (Instream Flow Charts for Richmond Gage)** – Illustrates measured river flow, SB3 flow criteria, and base flow status for USGS 08114000 (Brazos Rv at Richmond, TX).
- **Tab R1 (General Reference Data)** – Contains general reference information on water right parameters, environmental flow parameters, and unit conversion factors. The Reference tab also provides a location for inputs which do not need to occur at a daily timescale.
- **Tab R2 (Drop Down Selection Reference)** – Contains a static reference list of GCWA water right priority dates which is utilized by drop-down selections on other tabs of the workbook.

### 3.3.1 Tab 1 (Summary of Results)

Tab 1 includes a condensed overview of cumulative usage of GCWA water rights and other sources, diversion rates, remaining diversions requiring allocation by the user, and notification of potential conflicts or data entry issues. Specific sections of the tab are discussed in greater detail below.

#### 3.3.1.1 GCWA Run-of-River Rights

This table provides a condensed summary of usage of GCWA run-of-river water rights based on the user inputs and calculations from the other tabs of the workbook. Parameters shown include year-to-date diversions, remaining unused annual appropriations, percent of annual appropriations used, and maximum diversion rates. Results in excess of allowable values trigger conditional formatting within the section to alert the user to potential data entry issues.

#### 3.3.1.2 Meter Recordings

This table provides a condensed summary of diversions from each of GCWA's three Brazos River diversion locations. Parameters shown include summaries from GCWA water rights and other sources accessible by GCWA, diversion rates, and any over- or under-allocation of diversions. Results in excess of allowable values or indicating under- or over-allocation trigger conditional formatting within the section to alert the user to potential data entry issues.

#### 3.3.1.3 Warnings

This table acts as a centralized location for detecting and notifying the user of a range of potential issues in this and other tabs. Cells within the section remain blank unless a potential issue is detected, which causes a warning message to become visible. Each warning message is accompanied by recommendations on potential locations in the workbook for the user to examine.

### 3.3.2 Tab 2 (Input Data Sheet for Basic Data)

This tab provides a location for inputs related to priority water right calls and stream flow measurements. The summary section at the top of the tab aggregates the daily data by month and also provides user alerts through conditional formatting. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Tables 2a and 2b of Appendix A.

#### 3.3.2.1 Date (Columns 2.1 to 2.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1. Tab R1 also determines if the accounting year is a leap year, allowing this and other tabs to automatically adjust date ranges.

#### 3.3.2.2 Priority Call (Columns 2.4 to 2.6)

The Priority Call section provides a location for input of water right priority calls, with a dropdown selection used to select the most senior GCWA appropriation which would be impacted by the call. This section also allows the input of threshold gage flow rates for temporary suspension of a priority call. Based on prior calls, the threshold rate is assumed to be located at USGS 08116650 (Brazos Rv nr Rosharon, TX). Future priority calls that may use a different gage may require modification to these columns. If the call does not include temporary suspension based on gage flow, then column 2.5 is left blank during the call. The values input in this section are used elsewhere in the workbook to calculate the accessibility of GCWA appropriations. In a basin with a Watermaster, such as this portion of the Brazos River, priority calls directly from downstream senior water rights holders are not likely to occur. The term priority call as used in this report and in the Accounting Plan is therefore also intended to refer to the Watermaster's advance communication to GCWA that water at a specific priority date is needed downstream to meet a senior need, as documented through a Declaration of Intent to Divert.

#### 3.3.2.3 Richmond Gage Flows (Columns 2.7 to 2.9)

This section provides a location for the user to input measured stream flows at USGS 08114000 (Brazos Rv at Richmond, TX). In the event that the flow measurement is missing or erroneous, an override column allows the user to enter a value which supersedes the gage flow value.

#### 3.3.2.4 Rosharon Gage Flows (Columns 2.10 to 2.12)

This section provides a location for the user to input measured stream flows at USGS 08116650 (Brazos Rv nr Rosharon, TX). In the event that the flow measurement is missing or erroneous, an override column allows the user to enter a value which supersedes the gage flow value.

### 3.3.2.5 CoA 12-5322 Bypass Requirement (Columns 2.13 to 2.15)

The Bypass Requirement section includes the Rosharon gage flow requirement included in CoA 12-5322. The base bypass requirement is 15 cfs for the months of April through August and 5 cfs for the remainder of the year. In the event that conditions necessitate an alternate flow requirement value to protect downstream senior rights as described in CoA 12-5322, an override column allows the user to enter an alternate limit which supersedes the default value.

### 3.3.3 Tabs 3, 4, and 5 (Input Data Sheets for Diversion Locations)

Tabs 3, 4, and 5 serve as the location for input of diversions from each of GCWA's Brazos River diversion locations as well as assignment of this volume to GCWA water rights or other sources accessible by GCWA. These tabs also provide indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, or other factors. The summary section at the top of the tab aggregates results to a monthly level and also provides user alerts through conditional formatting. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Tables 3-5a and 3-5b of Appendix A. Because the same section and column layout is used for each of the three tabs, location and tab identifiers are shown below with "X".

#### 3.3.3.1 Date (Columns X.1 to X.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1.

#### 3.3.3.2 GCWA Diversions at Location X (Columns X.4 to X.9)

The GCWA Diversions section serves as the location for input of metered diversions for each diversion location. In the event that the flow measurement is missing or erroneous, override columns for passive flow-through during large flow events or other causes allow the user to enter a value which supersedes the metered diversion value. Only one of these overrides should be used on a given day. If more than one column is used, column X.7 will indicate an error. This section also tracks the amount of the daily diversion that has not yet been assigned against a GCWA water right or another source.

#### 3.3.3.3 GCWA Diversion Allocations at Location X (Columns X.10 to X.23)

The Diversion Allocations section allows the user to assign the diversion from each location against GCWA's water right appropriations and other sources from the Brazos River. For each

GCWA right and priority date in the daily entries, there is a paired column providing a Y/N indicator to notify the user if assignment to that water right portion is allowable on a particular day. These flags are set using logic on Tab 8 which tracks cumulative use, maximum diversion rates, CoA 12-5322 gage flow requirements, and right-specific bypass requirements. For Location A, the flag-setting logic also examines compliance with SB3 subsistence and dry-condition base flow environmental flow standards referencing the Richmond gage. At Location J, SB3 subsistence standards at the Rosharon gage are included. The Y/N flag logic is dynamic, so entering a number which exceeds a limiting parameter will automatically change the flag and trigger warnings through conditional formatting. Finally, column X.23 allows the user to manually assign part or all of the diversions to contractual supply sources.

### 3.3.4 Tab 6 (Summary of Diversions by Source and Location)

Tab 6 summarizes monthly diversions by CoA and diversion location, as well as diversions assigned against other sources. Values in the tab are primarily derived from the user entries on Tabs 3, 4, and 5. Tab 6 is not used for data entry. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Table 6 of Appendix A.

#### 3.3.4.1 Date (Column 6.1)

The Date section establishes date information for the tab.

#### 3.3.4.2 CA 5168 Diversions (Columns 6.2 to 6.5)

This section summarizes monthly diversions assigned to CoA 12-5168 from each take point and in total.

#### 3.3.4.3 CA 5322 Diversions (Columns 6.6 to 6.9)

This section summarizes monthly diversions assigned to CoA 12-5322 from each take point and in total.

#### 3.3.4.4 CA 5171 Diversions (Columns 6.10 to 6.13)

This section summarizes monthly diversions assigned to CoA 12-5171 from each take point and in total.

#### 3.3.4.5 CoA Diversions (Columns 6.14 to 6.17)

This section summarizes total GCWA water right diversions by location and month.

#### 3.3.4.6 Other Diversions (Columns 6.18 to 6.21)

The Other Diversions sections summarize diversions by diversion location and month for sources other than GCWA Brazos River water rights.

### 3.3.5 Tab 7 (Water Rights Reporting)

Tab 7 presents the information from Tab 6 in a more condensed form, eliminating the diversion by location. Tab 7 is not used for data entry. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Table 7 of Appendix A.

#### 3.3.5.1 Date (Column 7.1)

The Date section establishes date information for the tab.

#### 3.3.5.2 GCWA Water Rights (Columns 7.2 to 7.5)

This section summarizes diversions by month for each GCWA Brazos River water right. Values are primarily linked from Tab 6.

### 3.3.6 Tab 8 (Daily Computations for Run-of-River Rights)

Tab 8 is the primary location for calculations related to GCWA run-of-river water right accessibility, including tracking of cumulative and remaining supplies, by right and priority, and other factors which could impact daily accessibility of an authorization, including priority calls, permitted diversion rates, and environmental flows. The calculations on this tab are referenced by the summary and warning tables on Tab 1 as well as the accessibility flags on Tabs 3 – 5. Tab 8 is not used for data entry. The summary section at the top of the tab aggregates results by month and also provides user alerts through conditional formatting. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Tables 8a and 8b of Appendix A.

#### 3.3.6.1 Date (Columns 8.1 to 8.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1.



#### 3.3.6.2 GCWA Run-of-River Diversions (Columns 8.4 to 8.9)

The GCWA Run-of-River Diversions section calculates the total daily diversion credited against each priority portion of each GCWA water right based on the user inputs from Tabs 3, 4, and 5. These values are used by other sections of the tab in evaluation of cumulative right use and daily accessibility.

#### 3.3.6.3 Priority Call Data (Columns 8.10 to 8.12)

The Priority Call Data section replicates the priority call information from Tab 2. These values are used by other sections of the current tab in evaluation of daily accessibility.

#### 3.3.6.4 Environmental Flow Data and Checks (Columns 8.13 to 8.20)

This section examines compliance with various instream flow parameters. Rosharon gage flows and CoA 12-5322 flow requirements from Tab 2 are compared to determine if flows exceed the permit-imposed threshold each day. A Y/N flag used by other calculations on the tab is generated to flag CoA 12-5322 as not accessible on days where the threshold is not met. There is a calculation to generate a warning flag if diversions are made when the flow condition is not achieved. The section also replicates SB3 flow achievements from Tab 9 to generate a Y/N flag used by other calculations to determine daily accessibility for CoA 12-5322 diversions at Location A, based on SB3 standards at the Richmond gage. The section also compares the flow at the Rosharon gage to SB3 subsistence flow requirements to determine daily accessibility for CoA 12-5168 and CoA 12-5171 at Location J. There are additional calculations to generate warning flags if diversions are made when applicable flow conditions for a location are not achieved.

#### 3.3.6.5 Run-of-River Diversion Rate Check (Columns 8.21 to 8.32)

The Diversion Rate Check section converts the daily diversion rate from each water right appropriation listed in the GCWA Run-of-River Diversions section of the tab to an equivalent average daily diversion in cfs. This value is then compared against the permitted maximum diversion rate for that appropriation to generate a Y/N flag used by other calculations on the tab to determine supply accessibility. A similar process applies to the combined diversion from the three priority appropriations under CoA 12-5322, which have both individual and, effectively, a combined maximum diversion rate.

#### 3.3.6.6 CoA Tracking and Checks (Columns 8.33 to 8.74)

The CoA Tracking and Checks sections perform cumulative diversion tracking and accessibility checks for each priority appropriation under GCWA's Brazos River water rights. For each of these sections, the following processes are applied:

- Cumulative (year-to-date) diversions are calculated and remaining supplies are calculated by subtracting cumulative diversions from the authorized amount.
- Priority call information is examined to set a Y/N flag indicating whether an appropriation is subject to a senior call. If the priority cutoff is equal or senior to the appropriation and either (a) no call suspension flow rate is in place or (b) flows at the Rosharon gage are below the call suspension flow rate, the flag is set to "Y" to indicate that the appropriation is limited by an active priority call.
- For appropriations under CoA 12-5322, the status flag for achievement of the bypass flow requirement in the permit is replicated from the corresponding section of the tab.
- Diversion rate checks from the preceding section are examined to set a Y/N flag indicating whether an appropriation is within the maximum permitted diversion rate. If the rate checks show that (a) the diversions for the appropriation are within the corresponding maximum and (b) where applicable, all diversions under the water right are within the combined maximum rate, the flag is set to "Y".
- The preceding items in the section are then used to make a preliminary assessment of accessibility of the priority appropriation and set a Y/N flag. If there is:
  - remaining supply, and
  - either no applicable priority call or a suspended call, and
  - CoA 12-5322 environmental flow rates have been met, and
  - specified diversions are within the permitted rate,

then the flag is set to "Y". If any of the specified factors is not achieved, the flag is set to "N" to indicate that the priority appropriation is inaccessible. This flag is utilized on Tabs 3, 4, and 5 in conjunction with location-specific factors to set final accessibility indicators on those tabs.

- For priority appropriations under CoA 12-5322, a check is made to determine if the user has entered a diversion when the permitted flow requirement has not been met. This is used to set a Y/N flag utilized elsewhere in the workbook to notify the user of potential data entry issues.
- A check is made to determine if the user has entered a diversion when the appropriation is limited by a priority call. This is used to set a Y/N flag utilized elsewhere in the workbook to notify the user of potential data entry issues.

### 3.3.7 Tabs 9 and 10 (Instream Flow Computations)

Tab 9 tracks attainment of SB3 environmental flow requirements for gaging stations USGS 08114000 (Brazos Rv at Richmond, TX). These tabs are used by other tabs as part of the logic to determine daily water right accessibility for CoA 12-5322 at Location A. Specific sections of Tab 9 are discussed in greater detail below, with details on specific calculations provided in Tables 9a and 9b of Appendix A. Tab 10 provides graphical summaries of flow and SB3 criteria and is therefore not discussed in detail below.

#### 3.3.7.1 Date (Columns 9.1 to 9.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1.

#### 3.3.7.2 Season and Condition (Columns 9.4 to 9.7)

The Season and Condition section establishes season and conditions used by calculations in other sections of the tab. Season and season code are based on the date ranges specified in the Title 30, Texas Administrative Code (TAC) §298.455 for the basin. Conditions are calculated from user inputs of seasonal parameters entered on Tab R1.

#### 3.3.7.3 Base Flow (Columns 9.8 to 9.12)

The Base Flow section determines daily base flow target achievement. Gage flows, subsistence flow and base flow criteria are imported from tab R1 and are used to set a daily flow criterion, which varies based on season, climatic condition, and flow. The following procedure is applied to determine the daily criterion:

- If seasonal climatic conditions are in the Dry category:

- If gage flows are below the subsistence flow, the criterion equals the subsistence flow.
- If gage flows are between the subsistence flow and base flow, the criterion is the subsistence flow plus 50 percent of the difference between gage and subsistence flows.
- If gage flows are above the base flow, the criterion is the base flow.
- For all other seasonal climatic conditions, the daily criterion is the dry condition base flow.

The gage flow is then compared against the selected criterion to set a daily achievement flag.

#### 3.3.7.4 Comments (Column 9.13)

This is an optional input column.

### 3.3.8 Tab R1 (General Reference Data)

Tab R1 contains general reference information on water right and contract parameters and unit conversion factors. The Reference tab also provides a location for inputs which do not need to occur at a daily timescale. Information on this tab is utilized extensively by other tabs within the workbook. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Table R1 of Appendix A.

#### 3.3.8.1 Year Reference Data (Columns R1.1 to R1.2)

The Year Reference Data section provides a location for the user to enter the year of the Accounting Plan. The plan calculates whether or not it is a leap year. Date information and year length on the other tabs are calculated using this reference.

#### 3.3.8.2 Source Reference Data (Columns R1.3 to R1.8)

The Source Reference Data section contains reference data for water sources which GCWA may divert at its three Brazos River diversion points, including source identifier and type, annual allowable volume, priority date, maximum diversion rate, and use type.

#### 3.3.8.3 PHDI Reference Data (Columns R1.9 to R1.12)

The PHDI Reference Data section provides a location for the user to enter seasonal information on climatic conditions, including the Palmer Hydrologic Drought Index (PHDI), along with the corresponding climatic condition code for the lower Brazos River Basin as defined in 30 TAC §298(G).

#### 3.3.8.4 SB3 Parameters for USGS 08114000 Brazos River at Richmond (Columns R1.13 to R1.17)

This section contains SB3 environmental flow factors from the TAC for gaging station USGS 08114000 (Brazos Rv at Richmond, TX). Parameters within this section include base and subsistence flow targets, by season. In accordance with TCEQ guidance to GCWA, dry condition base flow targets are applied for average and wet conditions. The contents of the section are static values referenced by calculations on Tab 9.

#### 3.3.8.5 SB3 Parameter for USGS 08116650 Brazos nr Rosharon (Columns R1.18 to R1.20)

This section contains the SB3 subsistence environmental flow factor from the TAC for gaging station USGS 08116650 (Brazos Rv near Rosharon, TX). The section includes a single static value for the subsistence flow target which is not varied by season or hydrologic condition. The contents of the section are referenced by calculations on Tab 8.

#### 3.3.8.6 Conversion Factors (Columns R1.21 to R1.23)

This section lists common unit conversion factors for use by other tabs of the workbook.

#### 3.3.9 Tab R2 (Domains)

This tab contains priority dates for the GCWA water rights, which are used in dropdown list input columns on other tabs.

## Appendix A

### Detailed Calculation Table Summaries

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**Appendix A, Table 2a**

Column No	Type <sup>1</sup>	Label	Units	Description	Tab Conn. <sup>2</sup>
2.1	Ref	Day		Day of year.	
2.2	Ref	Month		Month of year.	
2.3	Ref	Date		Date reference.	R1.2
2.4	Input	Cutoff Date		Input data. GCWA rights at or junior to the selected date are subject to relevant priority call.	R2
2.5	Input	Call Suspension Flow Rate	cfs	Input data. Flow rate associated with a temporary suspension of a priority call as measured at USGS gage 08116650 (Brazos Rv near Rosharon).	
2.6	Calc	Priority Call Issued?	Y/N	If cutoff date provided [2.4], "Y". Else, "N".	
2.7	Input	Richmond Gage Flow	cfs	Input data. Flow at USGS gage 08114000 (Brazos Rv at Richmond).	
2.8	Input	Richmond Gage Override	cfs	Input data (optional). Overrides flow at USGS gage 08114000 from time series input in [2.7].	
2.9	Calc	Richmond Adjusted Gage Flow	cfs	If gage override provided [2.8], equals [2.8]. Else, equals measured gage flow [2.7].	
2.10	Input	Rosharon Gage Flow	cfs	Input data. Flow at USGS gage 08116650 (Brazos Rv near Rosharon).	
2.11	Input	Rosharon Gage Override	cfs	Input data (optional). Overrides flow at USGS gage 08116650 from time series input in [2.10] in the event of missing or erroneous measurements or other issues.	
2.12	Calc	Rosharon Adjusted Gage Flow	cfs	If gage override provided [2.11], equals [2.11]. Else, equals measured gage flow [2.10].	



Column No	Type <sup>1</sup>	Label	Units	Description	Tab Conn. <sup>2</sup>
2.13	Calc	CoA 12-5322 Base Bypass	cfs	Default bypass flow associated with CoA 12-5322. For April through August, equal to 15 cfs. Else, equal to 5 cfs.	
2.14	Input	Alternate Limit	cfs	Input data (optional). User override for base bypass flow.	
2.15	Calc	CoA 12-5322 Adjusted Bypass	cfs	If alternate limit provided [2.14], equals [2.14]. Else, equals base bypass requirement [2.13].	

1. Several abbreviations for Accounting Plan column type are applied in the Accounting Plan and in this and other Appendix A summary tables. "Ref" indicates reference data, "Calc" signifies automated workbook calculations, and "Input" is used for both mandatory user input columns and optional data override columns.

2. The "Tab Conn." field shown in this and other Appendix A summary tables provides information on formula connections to other workbook tabs.

**Appendix A, Table 2b**

Column No	Type <sup>1</sup>	Label	Units	Description	Tab Conn.
2.1	Ref	Days		Number of days in month.	
2.2	Ref	Month		Month of year.	
2.3	Ref	End Date		End date for given month.	R1.2
2.4	Input*	# of Days Priority Call Active?	count	Monthly count of days for which a priority call is issued.	
2.5	Input*	Call Suspension Flow Rate	Y/N	If call suspension flow rate (daily) was entered for one or more days in a given month, equals "Y". Else, equals "N".	
2.6	Calc	Priority Call Issued?	Y/N	If priority call was issued for one or more days in a given month, equals "Y". Else, equals "N".	
2.7	Input*	Richmond Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08114000 (Brazos Rv at Richmond).	R1.23
2.8	Input*	Richmond Gage Override	count	Monthly count of days for which an override flow at gage 08114000 has been applied.	
2.9	Calc	Richmond Adjusted Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08114000 (Brazos Rv at Richmond) after applying override flows.	R1.23
2.10	Input*	Rosharon Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08116650 (Brazos Rv near Rosharon).	R1.23
2.11	Input*	Rosharon Gage Override	count	Monthly count of days for which an override flow at gage 08116650 has been applied.	
2.12	Calc	Rosharon Adjusted Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08116650 (Brazos Rv near Rosharon) after applying override flows.	R1.23

Column No	Type <sup>1</sup>	Label	Units	Description	Tab Conn.
2.13	Calc	CoA 12-5322 Base Bypass	ac-ft	Monthly sum of CoA 12-5322 base bypass flows.	R1.23
2.14	Input*	Alternate Limit	count	Monthly count of days for which an alternate bypass limit has been applied.	
2.15	Calc	CoA 12-5322 Adjusted Bypass	ac-ft	Monthly sum of CoA 12-5322 bypass flows after applying alternate limits.	R1.23

1. Inputs are entered at the daily level as shown in Appendix A, Table 2a above.

**Appendix A, Table 3a, 4a, 5a**

Column No	Type	Label <sup>1</sup>	Units	Description	Tab Conn. <sup>2</sup>
X.1	Ref	Day		Day of year.	2.1
X.2	Ref	Month		Month of year.	2.2
X.3	Ref	Date		Date reference.	2.3
X.4	Input	Metered Diversions	MG	Input data. Metered diversions at the given take point.	
X.5	Input	Override for Spilling	MG	Input data (optional). Manual entry for diversion at the given take point when high river flows cause flow into a GCWA canal when not pumping for diversion purposes.	
X.6	Input	Other Override	MG	Input data (optional). Manual entry for diversion at the given take point to address other measurement issues.	
X.7	Calc	Override Check	none	If alternate diversion values are entered in both [3.5] and [3.6], equals "ERROR". Else, cell is blank.	
X.8	Calc	Diversions	ac-ft	If alternate diversion value entered in either [3.5] or [3.6], equal to [3.5] or [3.6]. Else, equal to [3.4].	R1.23
X.9	Calc	Unassigned Flow	ac-ft	Diversions which have not been assigned either to ROR water rights or other sources. Equal to [3.8] less the sum of [3.22] and [3.23].	
X.10	Input	CoA 5322 (1983)	ac-ft	Input data. Assignment of diversion to CoA 12-5322 under 1983 priority date.	
X.11	Calc	Avail.	Y/N	If supply is available ([8.38] is "Y") and, for Location A, if Richmond gage flow meets base criteria ([8.19] is "Y"), equal "Y". Else, equal "N".	8.19*, 8.38
X.12	Input	CoA 5322 (1955)	ac-ft	Input data. Assignment of diversion to CoA 12-5322 under 1955 priority date.	
X.13	Calc	Avail.	Y/N	If supply is available ([8.46] is "Y") and, for Location A, if Richmond gage flow meets base criteria ([8.19] is "Y"), equal "Y". Else, equal "N".	8.19*, 8.46
X.14	Input	CoA 5171 (1950)	ac-ft	Input data. Assignment of diversion to CoA 12-5171 under 1950 priority date.	

Column No	Type	Label <sup>1</sup>	Units	Description	Tab Conn. <sup>2</sup>
X.15	Calc	Avail.	Y/N	If supply is available ([8.53] is "Y") and, for Location J, if Rosharon gage flow meets subsistence criterion ([8.17] is "Y"), equal "Y". Else, equal "N".	8.17*, 8.53
X.16	Input	CoA 5171 (1939)	ac-ft	Input data. Assignment of diversion to CoA 12-5171 under 1939 priority date.	
X.17	Calc	Avail.	Y/N	If supply is available ([8.59] is "Y") and, for Location J, if Rosharon gage flow meets subsistence criterion ([8.17] is "Y"), equal "Y". Else, equal "N".	8.17*, 8.59
X.18	Input	CoA 5322 (1929)	ac-ft	Input data. Assignment of diversion to CoA 12-5322 under 1929 priority date.	
X.19	Calc	Avail.	Y/N	If supply is available ([8.66] is "Y") and, for Location A, if Richmond gage flow meets base criteria ([8.19] is "Y"), equal "Y". Else, equal "N".	8.19*, 8.66
X.20	Input	CoA 5168 (1926)	ac-ft	Input data. Assignment of diversion to CoA 12-5168 under 1926 priority date.	
X.21	Calc	Avail.	Y/N	If supply is available ([8.73] is "Y") and, for Location J, if Rosharon gage flow meets subsistence criterion ([8.17] is "Y"), equal "Y". Else, equal "N".	8.17*, 8.73
X.22	Calc	Total ROR Diversions	ac-ft	Sum of [3.10], [3.12], [3.14], [3.16], [3.18], and [3.20].	
X.23	Input	Total Contract Diversions	ac-ft	Input data. Manual assignment of diversion to BRA contract.	

1. The above parameters are entered for Location A (Shannon pump station) in Table 3, for Location B (Briscoe pump station) in Table 4, and for Location J (May pump station) in Table 5.

2. [8.17] checks whether environmental flow conditions have been met at the Rosharon gage; this reference is only applicable in Table 5 (May pump station). [8.19] checks whether environmental flow conditions have been met at the Richmond gage; this reference is only applicable in Table 3 (Shannon pump station).

**Appendix A, Table 3b, 4b, 5b**

Column No	Type <sup>1</sup>	Label <sup>2</sup>	Units	Description	Tab Conn.
X.1	Ref	Days		Number of days in month.	
X.2	Ref	Month		Month of year.	
X.3	Ref	End Date		End date for given month.	R1.2
X.4	Input*	Metered Diversions	ac-ft	Monthly sum of metered diversions at the given take point.	R1.23
X.5	Input*	Override for Spilling	count	Monthly count of days for which an override for spilling has been applied.	
X.6	Input*	Other Override	count	Monthly count of days for which a non-spilling override has been applied.	
X.7	Calc	Override Errors?	count	Monthly count of days for which two different diversion overrides were input.	
X.8	Calc	Diversions	ac-ft	Monthly sum of diversions at the given take point, after inclusion of alternate diversion amounts.	
X.9	Calc	Unassigned Flow	ac-ft	Monthly sum of diversions which have not been assigned to either ROR rights or BRA contracts.	
X.10	Input*	CoA 5322 (1983)	ac-ft	Monthly sum of diversion allocations to CoA 12-5322 under 1983 priority date.	
X.11	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.12	Input*	CoA 5322 (1955)	ac-ft	Monthly sum of diversion allocations to CoA 12-5322 under 1955 priority date.	
X.13	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.14	Input*	CoA 5171 (1950)	ac-ft	Monthly sum of diversion allocations to CoA 12-5171 under 1950 priority date.	

Column No	Type <sup>1</sup>	Label <sup>2</sup>	Units	Description	Tab Conn.
X.15	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.16	Input*	CoA 5171 (1939)	ac-ft	Monthly sum of diversion allocations to CoA 12-5171 under 1939 priority date.	
X.17	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.18	Input*	CoA 5322 (1929)	ac-ft	Monthly sum of diversion allocations to CoA 12-5322 under 1929 priority date.	
X.19	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.20	Input*	CoA 5168 (1926)	ac-ft	Monthly sum of diversion allocations to CoA 12-5168 under 1926 priority date.	
X.21	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.22	Calc	Total ROR Diversions	ac-ft	Monthly sum of all diversions allocated to CoA 12-5322, CoA 12-5171, and CoA 12-5168.	
X.23	Input*	Total Contract Diversions	ac-ft	Monthly sum of diversion allocations to BRA contracts.	

1. Inputs are entered at the daily level as shown in Appendix A, Table 3A, 4A, 5A above.

2. The above parameters are entered for Location A (Shannon pump station) in Table 3, for Location B (Briscoe pump station) in Table 4, and for Location J (May pump station) in Table 5.

**Appendix A, Table 6**

Column No	Type	Section	Label	Units	Description	Tab Conn.
6.1	Ref		Month		Date reference.	
6.2	Calc	CA 5168 Diversions	Location A	ac-ft	Diversions under CoA 12-5168 at diversion location A. Repeated from Table 3.	3.20
6.3	Calc		Location B	ac-ft	Diversions under CoA 12-5168 at diversion location B. Repeated from Table 4.	4.20
6.4	Calc		Location J	ac-ft	Diversions under CoA 12-5168 at diversion location J. Repeated from Table 5.	5.20
6.5	Calc		Total Diversions	ac-ft	Total diversions under CoA 12-5168. Sum of [6.2], [6.3], and [6.4].	
6.6	Calc	CA 5322 Diversions	Location A	ac-ft	Diversions under CoA 12-5322 at diversion location A. Sum of [3.10], [3.12], and [3.18].	3.10, 3.12, 3.18
6.7	Calc		Location B	ac-ft	Diversions under CoA 12-5322 at diversion location B. Sum of [4.10], [4.12], and [4.18].	4.10, 4.12, 4.18
6.8	Calc		Location J	ac-ft	Diversions under CoA 12-5322 at diversion location J. Sum of [5.10], [5.12], and [5.18].	5.10, 5.12, 5.18
6.9	Calc		Total Diversions	ac-ft	Total diversions under CoA 12-5322. Sum of [6.6], [6.7], and [6.8].	
6.10	Calc	CA 5171 Diversions	Location A	ac-ft	Diversions under CoA 12-5171 at diversion location A. Sum of [3.14] and [3.16].	3.14, 3.16
6.11	Calc		Location B	ac-ft	Diversions under CoA 12-5171 at diversion location B. Sum of [4.14] and [4.16].	4.14, 4.16
6.12	Calc		Location J	ac-ft	Diversions under CoA 12-5171 at diversion location J. Sum of [5.14] and [5.16].	5.14, 5.16
6.13	Calc		Total Diversions	ac-ft	Total diversions under CoA 12-5171. Sum of [6.10], [6.11], and [6.12].	



Column No	Type	Section	Label	Units	Description	Tab Conn.
6.14	Calc	GCWA Water Right Diversions	Location A	ac-ft	Total GCWA water right diversions from location A. Sum of [6.2], [6.6], and [6.10].	
6.15	Calc		Location B	ac-ft	Total GCWA water right diversions from location B. Sum of [6.3], [6.7], and [6.11].	
6.16	Calc		Location J	ac-ft	Total GCWA water right diversions from location J. Sum of [6.4], [6.8], and [6.12].	
6.17	Calc		Total Diversions	ac-ft	Total GCWA water right diversions. Sum of [6.14], [6.15], and [6.16].	
6.18	Calc	Other Diversions	Location A	ac-ft	Supply contract water diverted at Location A. Repeated from Table 3.	3.23
6.19	Calc		Location B	ac-ft	Supply contract water diverted at Location B. Repeated from Table 4.	4.23
6.20	Calc		Location J	ac-ft	Supply contract water diverted at Location J. Repeated from Table 5.	5.23
6.21	Calc		Total Diversions	ac-ft	Total supply contract water diverted. Sum of [6.18], [6.19], and [6.20].	

**Appendix A, Table 7**

Column No	Type	Label	Units	Description	Tab Conn.
7.1	Ref	Month		Date reference.	
7.2	Calc	CA 5168	ac-ft	Total diversions under CoA 12-5168. Repeated from Table 6.	6.5
7.3	Calc	CA 5322	ac-ft	Total diversions under CoA 12-5322. Repeated from Table 6.	6.9
7.4	Calc	CA 5171	ac-ft	Total diversions under CoA 12-5171. Repeated from Table 6.	6.13
7.5	Calc	Total	ac-ft	Sum of [7.2], [7.3], and [7.4].	

**Appendix A, Table 8a**

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.1	Ref		Day		Day of year.	2.1
8.2	Ref		Month		Month of year.	2.2
8.3	Ref		Date		Date reference.	2.3
8.4	Calc		CoA 5322 (1983)	ac-ft	Sum of CoA 12-5322 (1983 priority) diversions from Locations A [3.10], B [4.10], and C [5.10].	3.10, 4.10, 5.10
8.5	Calc		CoA 5322 (1955)	ac-ft	Sum of CoA 12-5322 (1955 priority) diversions from Locations A [3.12], B [4.12], and C [5.12].	3.12, 4.12, 5.12
8.6	Calc		CoA 5171 (1950)	ac-ft	Sum of CoA 12-5171 (1950 priority) diversions from Locations A [3.14], B [4.14], and C [5.14].	3.14, 4.14, 5.14
8.7	Calc		CoA 5171 (1939)	ac-ft	Sum of CoA 12-5171 (1939 priority) diversions from Locations A [3.16], B [4.16], and C [5.16].	3.16, 4.16, 5.16
8.8	Calc		CoA 5322 (1929)	ac-ft	Sum of CoA 12-5322 (1929 priority) diversions from Locations A [3.18], B [4.18], and C [5.18].	3.18, 4.18, 5.18
8.9	Calc		CoA 5168 (1926)	ac-ft	Sum of CoA 12-5168 (1926 priority) diversions from Locations A [3.20], B [4.20], and C [5.20].	3.20, 4.20, 5.20
8.10	Calc		Cutoff Date	Date	Rights at or junior to the selected date are subject to relevant priority call. Repeated from Table 2.	2.4
8.11	Calc		Call Suspension Flow Rate	cfs	Flow rate associated with a temporary suspension of a priority call as measured at USGS gage 08116650 (Brazos Rv near Rosharon). Repeated from Table 2.	2.5
8.12	Calc		Priority Call Issued?	Y/N	Repeated from Table 2.	2.6

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.13	Calc		Rosharon Adjusted Gage Flow	cfs	Flow at USGS gage 08114000 (Brazos Rv at Richmond) after any manual adjustment for missing or erroneous readings. Repeated from Table 2.	2.12
8.14	Calc		CoA 12-5322 Adjusted Bypass	cfs	Bypass flow associated with CoA 12-5322. Repeated from Table 2.	2.15
8.15	Calc		CoA 12-5322 Bypass Met?	Y/N	If Rosharon gage flow [8.13] exceeds CoA 12-5322 bypass flow [8.14], equals "Y". Else, equals "N".	
8.16	Calc		CoA 12-5322 Bypass Flag?	Y/N	If CoA 12-5322 bypass is not met ([8.15] is "N") and any diversions are allocated to CoA 12-5322 on that day ([8.4], [8.5], or [8.8] are greater than zero), equal to "Y". Else, equals "N".	
8.17	Calc		Rosharon Eflows Met?	Y/N	If Rosharon gage flow [8.13] meets or exceeds subsistence criteria [R1.20], "Y". Else, "N".	R1.20
8.18	Calc		Rosharon Eflow Flag?	Y/N	If instream flows are not met ([8.17] is "N") and any diversions are allocated to CoA 12-5168 or 12-5171 at Location J on that day ([5.14], [5.16], or [5.20]), equals "Y". Else, equals "N".	5.14, 5.16, 5.20
8.19	Calc		Richmond Eflows Met?	Y/N	If Richmond gage flow meets or exceeds base criteria ([9.12] is "TRUE"), "Y". Else, "N".	9.12
8.20	Calc		Richmond Eflow Flag?	Y/N	If instream flows are not met ([8.19] is "N") and any diversions are allocated to CoA 12-5322 at Location A on that day ([3.10], [3.12], or [3.18]), equals "Y". Else, equals "N".	3.10, 3.12, 3.18
8.21	Calc		5322 (1983) Rate	cfs	Conversion of [8.4] to cfs.	R1.23
8.22	Calc		Exceeds Limit?	Y/N	If [8.21] exceeds permitted rate, "Y". Else, "N".	R1.7
8.23	Calc		5322 (1955) Rate	cfs	Conversion of [8.5] to cfs.	R1.23

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.24	Calc		Exceeds Limit?	Y/N	If [8.23] exceeds permitted rate, "Y". Else, "N".	R1.7
8.25	Calc		5322 (1929) Rate	cfs	Conversion of [8.8] to cfs.	R1.23
8.26	Calc		Exceeds Limit?	Y/N	If [8.25] exceeds permitted rate, "Y". Else, "N".	R1.7
8.27	Calc		5322 Combined Rate	cfs	Sum of [8.4], [8.5], and [8.8], converted to cfs.	R1.23
8.28	Calc		Exceeds Limit?	Y/N	If [8.27] exceeds permitted rate, "Y". Else, "N".	R1.7
8.29	Calc		5171 Combined Rate	cfs	Sum of [8.6] and [8.7], converted to cfs.	R1.23
8.30	Calc		Exceeds Limit?	Y/N	If [8.29] exceeds permitted rate, "Y". Else, "N".	R1.7
8.31	Calc		5168 Rate	cfs	Conversion of [8.9] to cfs.	R1.23
8.32	Calc		Exceeds Limit?	Y/N	If [8.31] exceeds permitted rate, "Yes". Else, "No".	R1.7
8.33	Calc	CoA 5322 (1983)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5322 (1983 priority) in [8.4].	
8.34	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.33].	R1.5
8.35	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date [8.10] is senior or equal to 1983 priority date, "Y". Else, "N".	R1.6
8.36	Calc		CoA 12-5322 Bypass Met?	Y/N	Repeated from [8.15].	
8.37	Calc		Within Rate?	Y/N	If [8.22] and [8.28] are both "N", equal "Y". Else, equal "N".	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.38	Calc	CoA 5322 (1983)	Available Supply?	Y/N	If no priority call ([8.35] is "N"), bypass is met ([8.36] is "Y"), diversion is within rate ([8.37] is "Y") and either present-day or previous-day remaining supply [8.34] is greater than zero, equal "Y". Else, "N".	
8.39	Calc		CoA 12-5322 Bypass Flag?	Y/N	If diversion [8.4] is greater than zero and bypass is not met ([8.36] is "N"), then equals "Y". Else, equals "N".	
8.40	Calc		Priority Flag?	Y/N	If diversion [8.4] is greater than zero and non-suspended priority call has been issued ([8.35] is "Y"), then equals "Y". Else, equals "N".	
8.41	Calc	CoA 5322 (1955)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5322 (1955 priority) in [8.5].	
8.42	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.41].	R1.5
8.43	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date [8.10] is senior or equal to the 1955 priority date, "Y". Else, "N".	R1.6
8.44	Calc		CoA 12-5322 Bypass Met?	Y/N	Repeated from [8.15].	
8.45	Calc		Within Rate?	Y/N	If [8.24] and [8.28] are both "N", equal "Y". Else, equal "N".	
8.46	Calc		Available Supply?	Y/N	If no priority call ([8.43] is "N"), bypass is met ([8.44] is "Y"), diversion is within rate ([8.45] is "Y") and either present-day or previous-day remaining supply [8.42] is greater than zero, equal "Y". Else, "N".	
8.47	Calc		CoA 12-5322 Bypass Flag?	Y/N	If diversion [8.5] is greater than zero and bypass is not met ([8.44] is "N"), then equals "Y". Else, equals "N".	
8.48	Calc		Priority Flag?	Y/N	If diversion [8.5] is greater than zero and non-suspended priority call has been issued ([8.43] is "Y"), then equals "Y". Else, equals "N".	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.49	Calc	CoA 5171 (1950)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5171 (1950 priority) in [8.6].	
8.50	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.49].	R1.5
8.51	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date [8.10] is senior or equal to the 1950 priority date, "Y". Else, "N".	R1.6
8.52	Calc		Within Rate?	Y/N	If [8.30] is "N", equal "Y". Else, equal "N".	
8.53	Calc		Available Supply?	Y/N	If no priority call ([8.51] is "N"), diversion is within rate ([8.52] is "Y") and either present-day or previous-day remaining supply [8.50] is greater than zero, equal "Y". Else, "N".	
8.54	Calc		Priority Flag?	Y/N	If diversion [8.6] is greater than zero and priority call has been issued ([8.51] is "Y"), then equals "Y". Else, equals "N".	
8.55	Calc	CoA 5171 (1939)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5171 (1939 priority) in [8.7].	
8.56	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.55].	R1.5
8.57	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date [8.10] is senior or equal to the 1939 priority date, "Y". Else, "N".	R1.6
8.58	Calc		Within Rate?	Y/N	If [8.30] is "N", equal "Y". Else, equal "N".	
8.59	Calc		Available Supply?	Y/N	If no priority call ([8.57] is "N"), diversion is within rate ([8.58] is "Y") and either present-day or previous-day remaining supply [8.56] is greater than zero, equal "Y". Else, "N".	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.60	Calc	CoA 5171 (1939)	Priority Flag?	Y/N	If diversion [8.7] is greater than zero and non-suspended priority call has been issued ([8.57] is "Y"), then equals "Y". Else, equals "N".	
8.61	Calc	CoA 5322 (1929)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5322 (1929 priority) in [8.8].	
8.62	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.61].	R1.5
8.63	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date [8.10] is senior or equal to the 1929 priority date, "Y". Else, "N".	R1.6
8.64	Calc		CoA 12-5322 Bypass Met?	Y/N	Repeated from [8.15].	
8.65	Calc		Within Rate?	Y/N	If [8.26] and [8.28] are both "N", equal "Y". Else, equal "N".	
8.66	Calc		Available Supply?	Y/N	If no priority call ([8.63] is "N"), bypass is met ([8.64] is "Y"), diversion is within rate ([8.65] is "Y") and either present-day or previous-day remaining supply [8.62] is greater than zero, equal "Y". Else, "N".	
8.67	Calc		CoA 12-5322 Bypass Flag?	Y/N	If diversion [8.8] is greater than zero and bypass is not met ([8.64] is "N"), the equals "Y". Else, equals "N".	
8.68	Calc		Priority Flag?	Y/N	If diversion [8.8] is greater than zero and non-suspended priority call has been issued ([8.63] is "Y"), then equals "Y". Else, equals "N".	



Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.69	Calc	CoA 5168 (1926)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5168 (1926 priority) in [8.9].	
8.70	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.69].	R1.5
8.71	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date [8.10] is senior or equal to the 1926 priority date, "Y". Else, "N".	R1.6
8.72	Calc		Within Rate?	Y/N	If [8.32] is "N", equal "Y". Else, equal "N".	
8.73	Calc		Available Supply?	Y/N	If no priority call ([8.71] is "N"), diversion is within rate ([8.72] is "Y") and either present-day or previous-day remaining supply [8.70] is greater than zero, equal "Y". Else, "N".	
8.74	Calc		Priority Flag?	Y/N	If diversion [8.9] is greater than zero and non-suspended priority call has been issued ([8.71] is "Y"), then equals "Y". Else, equals "N".	

**Appendix A, Table 8b**

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.1	Ref		Days		Number of days in month.	
8.2	Ref		Month		Month of year.	
8.3	Ref		End Date		End date for given month.	2.3
8.4	Calc		CoA 5322 (1983)	ac-ft	Monthly sum of diversions allocated to CoA 12-5322 (1938).	
8.5	Calc		CoA 5322 (1955)	ac-ft	Monthly sum of diversions allocated to CoA 12-5322 (1955).	
8.6	Calc		CoA 5171 (1950)	ac-ft	Monthly sum of diversions allocated to CoA 12-5171 (1950).	
8.7	Calc		CoA 5171 (1939)	ac-ft	Monthly sum of diversions allocated to CoA 12-5171 (1939).	
8.8	Calc		CoA 5322 (1929)	ac-ft	Monthly sum of diversions allocated to CoA 12-5322 (1929).	
8.9	Calc		CoA 5168 (1926)	ac-ft	Monthly sum of diversions allocated to CoA 12-5168 (1926).	
8.10	Calc		# of Days Priority Call Active?	count	Monthly count of days for which a priority cutoff date has been applied.	
8.11	Calc		Call Suspension Flow Rate	Y/N	On a monthly basis, if one or more call suspension flow rates have been applied, "Y". Else, "N".	
8.12	Calc		Priority Call Issued?	Y/N	On a monthly basis, if one or more priority calls have been issued, "Y". Else, "N".	
8.13	Calc		Rosharon Adjusted Gage Flow	ac-ft	Monthly sum of flow past USGS gage 08116650 (Brazos Rv near Rosharon), converted to ac-ft.	R1.23
8.14	Calc		CoA 12-5322 Adjusted Bypass	ac-ft	Monthly sum of bypass flows, converted to ac-ft.	R1.23

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.15	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days for which required bypass flow was met.	
8.16	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.17	Calc		Rosharon Eflows Met?	count	Monthly count of days for which instream flows at USGS gage 08116650 (Brazos Rv near Rosharon) were met.	
8.18	Calc		Rosharon Eflow Flag?	count	On a monthly basis, if one or more instream flow flags were triggered, equal "Y". Else, "N".	
8.19	Calc		Richmond Eflows Met?	count	Monthly count of days for which instream flows at USGS gage 08114000 (Brazos Rv at Richmond) were met.	
8.20	Calc		Richmond Eflow Flag?	count	On a monthly basis, if one or more instream flow flags were triggered, equal "Y". Else, "N".	
8.21	Calc		5322 (1983) Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (1983).	
8.22	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 (1983) on one or more days, "Y". Else, "N".	
8.23	Calc		5322 (1955) Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (1955).	
8.24	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 (1955) on one or more days, "Y". Else, "N".	
8.25	Calc		5322 (1929) Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (1929).	
8.26	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 (1929) on one or more days, "Y". Else, "N".	
8.27	Calc		5322 Combined Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (total).	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.28	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 on one or more days, "Y". Else, "N".	
8.29	Calc		5171 Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5171.	
8.30	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5171 on one or more days, "Y". Else, "N".	
8.31	Calc		5168 Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5168.	
8.32	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5168 on one or more days, "Y". Else, "N".	
8.33	Calc	CoA 5322 (1983)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5322 (1983).	
8.34	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5322 (1983).	
8.35	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5322 (1983), "Y". Else, "N".	
8.36	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days on which the bypass flow for CoA 12-5322 has been met.	
8.37	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.37] in daily table is "N"), equal "N". Else, equal "Y".	
8.38	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5322 (1983).	
8.39	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.40	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5322 (1983) while under a priority call.	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.41	Calc	CoA 5322 (1955)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5322 (1955).	
8.42	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5322 (1955).	
8.43	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5322 (1955), "Y". Else, "N".	
8.44	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days on which the bypass flow for CoA 12-5322 has been met.	
8.45	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.45] in daily table is "N"), equal "N". Else, equal "Y".	
8.46	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5322 (1955).	
8.47	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.48	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5322 (1955) while under a priority call.	
8.49	Calc	CoA 5171 (1950)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5171 (1950).	
8.50	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5171 (1950).	
8.51	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5171 (1950), "Y". Else, "N".	
8.52	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.52] in daily table is "N"), equal "N". Else, equal "Y".	
8.53	Calc	CoA 5171 (1950)	Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5171 (1950).	
8.54	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5171 (1950) while under a priority call.	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.55	Calc	CoA 5171 (1939)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5171 (1939).	
8.56	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5171 (1939).	
8.57	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5171 (1939), "Y". Else, "N".	
8.58	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.58] in daily table is "N"), equal "N". Else, equal "Y".	
8.59	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5171 (1939).	
8.60	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5171 (1939) while under a priority call.	
8.61	Calc	CoA 5322 (1929)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5322 (1929).	
8.62	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5322 (1929).	
8.63	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5322 (1929), "Y". Else, "N".	
8.64	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days on which the bypass flow for CoA 12-5322 has been met.	
8.65	Calc	CoA 5322 (1929)	Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.65] in daily table is "N"), equal "N". Else, equal "Y".	
8.66	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5322 (1929).	
8.67	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.68	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5322 (1929) while under a priority call.	

Column No	Type	Permit	Label	Units	Description	Tab Conn.
8.69	Calc	CoA 5168 (1926)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5168 (1926).	
8.70	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5168 (1926).	
8.71	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5168 (1926), "Y". Else, "N".	
8.72	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.72] in daily table is "N"), equal "N". Else, equal "Y".	
8.73	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5168 (1926).	
8.74	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5168 (1926) while under a priority call.	

**Appendix A, Table 9a**

Column No	Type	Label	Units	Description	Tab Conn.
9.1	Ref	Day		Day of year.	2.1
9.2	Ref	Month		Month of year.	2.2
9.3	Ref	Date		Date reference.	2.3
9.4	Calc	Season	ref	Season for month [9.2], as defined in 30 TAC 298(G).	
9.5	Calc	Season Code	ref	Numeric code corresponding to season [9.4].	
9.6	Calc	Condition Code - Lower Basin	ref	Lower basin condition code [R1.11] corresponding to season in [9.4].	R1.9, R1.11
9.7	Calc	Condition - Lower Basin	ref	Lower basin condition [R1.12] corresponding to season in [9.4].	R1.9, R1.12
9.8	Calc	USGS 08114000 Brazos Rv at Richmond	cfs	Flows for USGS gage 08114000 (Brazos Rv at Richmond). Repeated from Table 2.	2.9
9.9	Calc	Subsistence Flow Criteria	cfs	Subsistence flow rate for current season.	R1.15, R1.16, R1.17
9.10	Calc	Base Flow Criteria	cfs	Baseflow for current season and climatic condition.	R1.15, R1.16, R1.17
9.11	Calc	Base Criteria Series	cfs	If climatic condition [9.6] is dry and gage flow [9.8] below subsistence criterion [9.9], equals [9.9]. If condition is dry and gage flow is between subsistence flow [9.9] and base flow [9.10], equals [9.9] plus half of difference between [9.8] and [9.9]. Else, equals [9.10].	
9.12	Calc	Meets Base Criteria?	T/F	If gage flow [9.8] greater than base criteria [9.11], "True". Else, "False".	
9.13	Input	Comments	none	Optional input for comments.	



**Appendix A, Table 9b**

Column No	Type	Label	Units	Description	Tab Conn.
9.1	Ref	Days		Number of days in month.	
9.2	Ref	Month		Month of year.	
9.3	Ref	End Date		End date for given month.	R1.2
9.4	Calc	Season	ref	Season corresponding to month of year, as defined in 30 TAC 298(G).	
9.5	Calc	Season Code	ref	Static season code value corresponding to [9.4].	
9.6	Calc	Condition Code - Lower Basin	ref	Lower basin condition code [R1.11] corresponding to season in [9.4].	R1.9, R1.11
9.7	Calc	Condition - Lower Basin	ref	Lower basin condition [R1.12] corresponding to season in [9.4].	R1.9, R1.12
9.8	Calc	Average Flow	cfs	Monthly average of flow at USGS gage 08114000 (Brazos Rv at Richmond).	
9.9	Calc	Subsistence Flow Criteria	cfs	Subsistence flow rate for given season [9.5].	R1.15, R1.16, R1.17
9.10	Calc	Base Flow Criteria	cfs	Baseflow for season [9.5] and climatic condition [9.6].	R1.15, R1.16, R1.17
9.11	Calc	Base Criteria Series (Average)	cfs	Monthly average of base criteria flow.	
9.12	Calc	Number of Days Meeting Base Series Criteria	count	Monthly count of days for which flow at Richmond gage meets base criteria.	
9.13	Input	Comments	none	Optional input for comments.	

**Appendix A, Table R1**

Column No	Type	Section	Label	Units	Description	Tab Conn.
R1.1	Ref	Year	Parameter		Row descriptor "Year" or "Leap Year".	
R1.2	Input /Calc		Value		Data entry cell for year of Accounting Plan and calculation cell to determine whether input year is a leap year.	
R1.3	Ref	Source Reference Data	Source		Contract or water right name of GCWA supply sources.	
R1.4	Ref		Type		Type of source.	
R1.5	Ref		Amount	ac-ft	Annual permitted volume.	
R1.6	Ref		Priority		Priority date associated with source.	
R1.7	Ref		Max Combined Rate	cfs	Maximum diversion rate associated with source.	
R1.8	Ref		Use Type		Permitted use type associated with source.	
R1.9	Ref	PHDI Reference Data	Season		Season name.	
R1.10	Input		Lower Basin PHDI		Palmer Hydrological Drought Index value on the last day of the month of the preceding season.	
R1.11	Input		Lower Basin Condition Code		Numeric code for condition based on PHDI [R1.10] value.	
R1.12	Input		Lower Basin Condition		Descriptive climatic condition based on PHDI [R1.10] value. Either "Dry", "Average", or "Wet".	

Column No	Type	Section	Label	Units	Description	Tab Conn.
R1.13	Ref	SB3 Parameters for USGS 08114000	Hydrologic Condition		Reference column for subsistence flows and base flows for dry, average, or wet climatic conditions.	
R1.14	Ref		Condition Code		Numeric code for conditions.	
R1.15	Ref		Winter	cfs	Subsistence and base flow standards during November through February, inclusive.	
R1.16	Ref		Spring	cfs	Subsistence and base flow standards during March through June, inclusive.	
R1.17	Ref		Summer	cfs	Subsistence and base flow standards during July through October, inclusive.	
R1.18	Ref	SB3 Parameter for USGS 08116650	Hydrologic Condition		Reference column indicating application of the subsistence flow standard for the gage for all hydrologic conditions.	
R1.19	Ref		Condition Code		Reference column indicating application of the subsistence flow standard for the gage for all hydrologic condition codes.	
R1.20	Ref		Flow Requirement	cfs	Subsistence flow standard for all seasons and hydrologic conditions.	
R1.21	Ref	Conversion Factors	To get:		Unit of output value for unit conversion operations.	
R1.22	Ref		From:		Unit of original value for unit conversion operations.	
R1.23	Ref		Multiply by:		Unit conversion factor to be multiplied by original value.	

**Gulf Coast Water Authority ADJ No. 12-5322G**

**January 27, 2021**

Accounting Plan with text file available upon request

**Blank Data**

Contact Mr. Chris Kozlowski at (512) 239-1801

**Gulf Coast Water Authority ADJ No. 12-5322G**

**January 27, 2021**

Accounting Plan with text file available upon request

**Synthetic Test Data**

Contact Mr. Chris Kozlowski at (512) 239-1801

## TCEQ Interoffice Memorandum

---

**To:** Office of the Chief Clerk  
Texas Commission on Environmental Quality

**Thru:** *Ch* Chris Kozlowski, Team Leader  
Water Rights Permitting Team

**From:** Bert Galvan, Work Leader  
Water Rights Permitting Team

**Date:** March 1, 2019

**Subject:** Gulf Coast Water Authority  
ADJ 5322  
CN600566152, RN104059472  
Application No. 12-5322G to Amend Certificate of Adjudication  
No. 12-5322  
Texas Water Code §§ 11.122, 11.085, 11.042, Requiring Limited &  
Full Basin Mailed and Published Notice  
Brazos River, Brazos River Basin  
Fort Bend County

TEXAS  
COMMISSION  
ON ENVIRONMENTAL  
QUALITY

2019 MAR -1 PM 2:25

CHIEF CLERKS OFFICE

The application and partial fees were received on October 26, 2018. Additional information and fees were received on January 28, 2019. The application was declared administratively complete and accepted for filing with the Office of the Chief Clerk on March 1, 2019. Notice is required to be published and mailed to the water right holders of record in the Brazos River Basin pursuant to Title 30 Texas Administrative Code (TAC) § 295.153(b), and to be mailed to the downstream water right holders of record in the San Jacinto-Brazos Coastal Basin pursuant to 30 TAC § 295.161(a).

All fees have been paid and the application is sufficient for filing.

*Bert Galvan*

Bert Galvan, Work Leader  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section

OCC Mailed Notice Required ☒ YES

☐ NO

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

March 1, 2019

Mr. Ivan Langford  
Gulf Coast Water Authority  
3630 FM 1765  
Texas City, Texas 77591-4824

RE: Gulf Coast Water Authority  
ADJ 5322  
CN600566152, RN104059472  
Application No. 12-5322G to Amend Certificate of Adjudication No. 12-5322  
Texas Water Code §§ 11.122, 11.085, 11.042, Requiring Limited & Full Basin  
Mailed and Published Notice  
Brazos River, Brazos River Basin  
Fort Bend County

Dear Mr. Langford:

This acknowledges receipt, on January 28, 2019, of additional information and fees in the amount of \$889.54 (Receipt No. M913356, copy enclosed).

The application was declared administratively complete and filed with the Office of the Chief Clerk on March 1, 2019. Staff will continue processing the application for consideration by the Executive Director.

Please be advised that additional information may be requested during the technical review phase of the application process.

If you have any questions concerning this matter please contact me via email at [humberto.galvan@tceq.texas.gov](mailto:humberto.galvan@tceq.texas.gov) or by telephone at (512) 239-4013.

Sincerely,

A handwritten signature in black ink, appearing to read "Bert Galvan".

Bert Galvan, Work Leader  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section

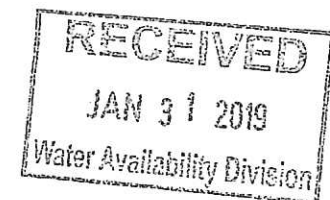
Enclosure



28-JAN-19 03:46 PM

## TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

<u>Fee Description</u>	<u>Fee Code</u> <u>Account#</u> <u>Account Name</u>	<u>Ref#1</u> <u>Ref#2</u> <u>Paid In By</u>	<u>Check Number</u> <u>Card Auth.</u> <u>User Data</u>	<u>CC Type</u> <u>Tran Code</u> <u>Rec Code</u>	<u>Slip Key</u> <u>Document#</u>	<u>Tran Date</u>	<u>Tran Amount</u>
NOTICE FEES-WUP- WATER USE PERM	PTGU	M913355	70775		BS00071231	28-JAN-19	- \$884.84
	PTGU	ADJ125168C	012819	N	D9802891		
NOTICE FEES WUP WATER USE PERMITS		GULF COAST WATER AUTHORITY	SPREDEAU	CK			
	PTGU	M913356	70777		BS00071231	28-JAN-19	- \$889.54
	PTGU	ADJ125322G	012819	N	D9802891		
NOTICE FEES WUP WATER USE PERMITS		GULF COAST WATER AUTHORITY	SPREDEAU	CK			
	PTGU	M913357	70776		BS00071231	28-JAN-19	- \$889.54
	PTGU	ADJ125171B	012819	N	D9802891		
NOTICE FEES WUP WATER USE PERMITS		GULF COAST WATER AUTHORITY	SPREDEAU	CK			
Total (Fee Code):							- \$2,663.92







Basis 2 A/R Outstanding Past Due Transactions Detail Report By Customer Name

FEB-25-19 06:30 AM

Customer Name: GULF COAST FRACTIONATORS

Account #: 90360085

Debtcollpath Stage:

Calls:

Total of delinquent transactions (Account): \$137.50

Total of delinquent transactions (Customer): \$137.50

Customer Name: GULF COAST SCRAP INTERNATIONAL

Account #: 20042873

Debtcollpath Stage:

Calls:

GPS	GPS0219698	GEN PMTS STORMWTR	FY19	TXR05CE42	31-DEC-18	31-JAN-19	\$200.00
GPS	SC00237338	LATE FEE - FEB 2019			10-FEB-19	10-FEB-19	\$10.00

Total of delinquent transactions (Account): \$210.00

Total of delinquent transactions (Customer): \$210.00

Customer Name: GULF COAST SEPTIC & SEWER CLEA

Account #: 0803992H

Debtcollpath Stage: UNCOL:EXHAUST

Calls: NOTES

WMS	WMS0028216	MUN TRAN SLDG FEE GALS	FY08	0000023992	31-JUL-08	31-AUG-08	\$500.00
WMS	SC2902-001	LATE FEE FOR WMS0028216		0000023992	10-OCT-08	10-OCT-08	\$25.00
WMS	SC2903-001	LATE FEE FOR WMS0028216		0000023992	12-NOV-08	12-NOV-08	\$3.43
WMS	SC2904-001	LATE FEE FOR WMS0028216		0000023992	10-DEC-08	10-DEC-08	\$3.43
WMS	WMS0029411	MUN TRAN SLDG FEE GALS	FY09	0000023992	31-JUL-09	31-AUG-09	\$500.00
WMS	SC00038906	LATE FEE - NOV 2010			10-NOV-10	10-NOV-10	\$3.54
WMS	SC00040686	LATE FEE - DEC 2010			10-DEC-10	10-DEC-10	\$3.54
WMS	SC00045328	LATE FEE - FEB 2011			10-FEB-11	10-FEB-11	\$3.54
WMS	SC00048491	LATE FEE - MAR 2011			10-MAR-11	10-MAR-11	\$3.54
WMS	SC00050948	LATE FEE - APR 2011			11-APR-11	11-APR-11	\$3.54
WMS	SC00052940	LATE FEE - MAY 2011			10-MAY-11	10-MAY-11	\$3.54
WMS	SC00054900	LATE FEE - JUN 2011			10-JUN-11	10-JUN-11	\$3.54
WMS	SC00056787	LATE FEE - JUL 2011			11-JUL-11	11-JUL-11	\$3.54

Total of delinquent transactions (Account): \$1060.18

Total of delinquent transactions (Customer): \$1060.18

Customer Name: GULF COAST STABILIZED MATERIAL

Account #: 20045950

Debtcollpath Stage:

Calls:

GPS	GPS0222921	GEN PMTS STORMWTR	FY19	TXR05EB97	31-DEC-18	31-JAN-19	\$200.00
GPS	SC00238282	LATE FEE - FEB 2019			10-FEB-19	10-FEB-19	\$10.00

Total of delinquent transactions (Account): \$210.00

Account #: 20045951

Debtcollpath Stage:

Calls:

GPS	GPS0222922	GEN PMTS STORMWTR	FY19	TXR05EB98	31-DEC-18	31-JAN-19	\$200.00
GPS	SC00238283	LATE FEE - FEB 2019			10-FEB-19	10-FEB-19	\$10.00

Total of delinquent transactions (Account): \$210.00

Total of delinquent transactions (Customer): \$420.00

Customer Name: GULF CONSOLIDATED SERVICES INC

Account #: 0021955U

Debtcollpath Stage: WHOLD:REFERRED,UNCOL:EXHAUST

Calls:

UST	UST0577902	U'GROUND TANK FEE TANKS:FY93	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577894	U'GROUND TANK FEE TANKS:FY01	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577893	U'GROUND TANK FEE TANKS:FY02	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577895	U'GROUND TANK FEE TANKS:FY00	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577896	U'GROUND TANK FEE TANKS:FY99	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577899	U'GROUND TANK FEE TANKS:FY96	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577897	U'GROUND TANK FEE TANKS:FY98	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577898	U'GROUND TANK FEE TANKS:FY97	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577900	U'GROUND TANK FEE TANKS:FY95	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	UST0577901	U'GROUND TANK FEE TANKS:FY94	0000034632	30-SEP-01	31-OCT-01	\$50.00
UST	SC2203-002	LATE FEE FOR UST0577901	0000034632	12-NOV-01	12-NOV-01	\$2.50
UST	SC2203-008	LATE FEE FOR UST0577895	0000034632	12-NOV-01	12-NOV-01	\$2.50
UST	SC2203-009	LATE FEE FOR UST0577894	0000034632	12-NOV-01	12-NOV-01	\$2.50
UST	SC2203-007	LATE FEE FOR UST0577896	0000034632	12-NOV-01	12-NOV-01	\$2.50

# BAKER BOTTS LLP

98 SAN JACINTO BLVD.  
SUITE 1500  
AUSTIN, TEXAS  
78701-4078

TEL +1 512.322.2500  
FAX +1 512.322.2501  
BakerBotts.com

## AUSTIN

BEIJING

BRUSSELS

DALLAS

DUBAI

HONG KONG

HOUSTON

LONDON

MOSCOW

NEW YORK

PALO ALTO

RIYADH

SAN FRANCISCO

WASHINGTON

January 28, 2019

VIA HAND DELIVERY

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
12100 Park 35 Circle  
Austin, Texas 78711-3087

Paulina Williams  
TEL: 5123223543  
FAX: 5123223643  
paulina.williams@bakerbotts.com

Re: Check associated with Gulf Coast Water Authority's Application No. 12-5322G  
to Amend Certificate of Adjudication No. 12-5322  
CN600566152, RN106128028

To whom it may concern:

Enclosed please find a check in the amount of \$889.54 associated with Gulf Coast Water Authority's Application No. 12-5322G to Amend Certificate of Adjudication No. 12-5322. Please process the check and return a stamped copy to the courier for the packet that will be delivered to the Water Availability Division for filing today.

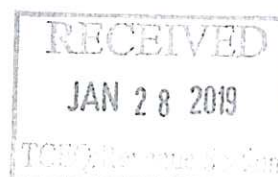
Please let me know if you have any questions.

Respectfully,



Paulina Williams

Enclosure



WATER RIGHTS PERMITTING

MEMORANDUM



Innovative approaches  
Practical results  
Outstanding service

10497 Town and Country Way, Suite 600 • Houston, Texas 77024 • 713-600-6800 • FAX 817-735-7491 www.freese.com

**TO:** Mr. Bert Galvan, Texas Commission on  
Environmental Quality

**FROM:** Philip I. Taucer, P.E.

**SUBJECT:** Gulf Coast Water Authority  
December 27, 2018 Request for Information  
Application No. 12-5322G to Amend  
Certificate of Adjudication No. 12-5322  
CN600566152, RN104059472  
Brazos River, Brazos River Basin  
Fort Bend County

**DATE:** January 24, 2019



## I. Introduction

This memorandum is in response to a request for additional information from the Texas Commission on Environmental Quality (TCEQ) received by the Gulf Coast Water Authority (GCWA) dated December 27, 2018. The letter indicates that additional information and remission of certain administrative fees are required to be submitted by January 28, 2019 before the application for CA 12-5322 can be declared administratively complete. The following sections summarize each of TCEQ's comments and provide responses with additional information and clarification.

## II. TCEQ Comment #1

### Comment

*Revise Page 3 of the Technical Information Report to reflect that this application is submitted under TWC 11.042(c). Staff notes that the water requested for conveyance in the bed and banks of Jones and Oyster Creeks is run-of-the-river water, not stored or conserved water.*

### Response

A revised version of Page 3 of the Technical Information Report is included in **Appendix 1** to this memorandum. The revised sheet includes responses of "Y" to Items 3a and 3e to clarify that GCWA is

requesting, as set forth in TWC §11.042(c), express incorporation of its bed and banks conveyance of its run-of-river water authorized by CA 12-5168, CA 12-5171, and CA 12-5322 as well as stored or conserved water diverted pursuant to contract. Information on source water rights and contract information may be found in **Appendix 2**. In accordance with the guidance for Item 3e, this change necessitates submittal of a Worksheet 2.0 which is included in **Appendix 3**. Because the requested bed and banks authorization is associated with Jones and Oyster Creeks within the American Canal System and does not seek to use the bed and banks of a reservoir, all questions on Worksheet 2.0 have been answered with “N/A” to indicate their non-applicability to this request.

### III. TCEQ Comment #2

#### Comment

*Confirm the locations of the 6 diversion points comprising the upstream and downstream limits of the three diversion reaches. The coordinates indicated on the maps in Attachment 1 are not consistent with the coordinates provided in Worksheets 3.0.*

#### Response

The source of the noted reach limit coordinate inconsistency has been identified in the electronic version of the amendment application and has been addressed. The revised Worksheet 3.0 forms for each reach limit are included in **Appendix 4**. Coordinates in the revised worksheets are consistent with the maps in the *Supplement to Applications for Water Right Amendments for Diversion from the Brazos River* submitted as part of the original amendment application.

### IV. TCEQ Comment #3

#### Comment

*Provide the following information in support of the request to authorize the bed and banks of Jones Creek and Oyster Creek to convey water, or, in the alternative, provide evidence showing that use of the bed and banks of Jones Creek and Oyster Creek is already authorized.*



## Response

Responses to TCEQ's comments regarding the bed and banks of Jones and Oyster Creeks are provided in the following sections. The amendment application does not seek a new appropriation of water but rather seeks to expressly incorporate into CA 12-5322 GCWA's current authorization to use the bed and banks of Jones and Oyster Creeks, portions of which comprise part of GCWA's existing American Canal System. This conveyance, including portions of Jones Creek and Oyster Creek, is a long-established feature developed primarily by the early 1940s that is originally associated with pre-Certificate water rights and subsequently affirmed by TCEQ as a right that carried forward under CA 12-5168. Included in **Appendix 5** is a document from the Texas Commission on Environmental Quality (TCEQ) confirming GCWA's authorization to use the bed and banks of Jones and Oyster Creeks. Also included in the appendix are historical documents of the canal demonstrating acceptance of the canal surveys by the Board of Water Engineers. To support the request for express incorporation of this bed and banks authorization into CA 12-5322, which we believe is a mere clarification of the existing authorization recognized under CA 12-5168 and applicable to all water under the control of GCWA, the applicant is providing the requested supporting information.

## V. TCEQ Comment #3a

### Comment

*Provide a completed Worksheet 3.0 for the diversion point at the end-point of the 42-mile conveyance reach. Staff notes that the discharge point identified in Worksheet 4.1 is the beginning point of the reach.*

### Response

The requested Worksheet 3.0 for the specified point, identified in the worksheet as GCWA Point #1c, is provided in **Appendix 6**. Supporting overview and diversion point maps are included in **Appendix 7**, with property access documentation in **Appendix 8**.

As illustrated in Figure 2 of **Appendix 7**, GCWA Point #1c reflects the location where the American Canal branches off from Oyster Creek and conveys flow previously introduced into Oyster Creek by GCWA eastward through constructed canal infrastructure. This location is not a new diversion point, but rather is a long-established feature of the American Canal System which was primarily developed by predecessor organizations to GCWA between 1905 and the early 1940s.

## VI. TCEQ Comment #3b

### Comment

*Provide the study documenting the method used to calculate the 20% conveyance loss value for the requested bed and banks reach, as described in Worksheet 4.0, item b.*

### Response

A study documenting analysis of conveyance loss in the GCWA system is included in **Appendix 9**. It should be noted that canal loss rates within GCWA's canals vary with specific location, flow, and other conditions. The 20 percent conveyance loss value indicated in Worksheet 4.0 is intended to reflect a conservative estimate of potential loss for the overall American Canal system, of which Jones and Oyster Creeks constitute a portion.

## VII. TCEQ Comment #3c

### Comment 3

*Provide a completed Worksheet 5.0, section 2, including measures to avoid impingement and entrainment of aquatic organisms, an assessment of the quantity and quality of flows remaining after the proposed diversion to meet instream uses and bay and estuary freshwater inflow requirements, and water quality information for the conveyed water. Water chemistry information should include, but not be limited to, the following parameters: chlorides, sulfates, total dissolved solids, pH, and temperature.*

### Response

As with GCWA's three diversion locations on the Brazos River, the American Canal's inclusion of portions of Jones and Oyster Creek and the exit of Oyster Creek at GCWA Point #1c are existing and long-established features; the conveyance for the proposed bed and banks authorization is a clarification to expressly incorporate the authorization into CA 12-5322. Because the applicant and the application does not propose constructing new stream intake facilities at this time, the measures taken to avoid impingement and entrainment of aquatic organisms are the same as those on the existing structures.

Flows exiting Oyster Creek at GCWA Point #1c are derived from water previously introduced by GCWA into an existing conveyance through Jones and Oyster Creeks, including flows previously diverted from the Brazos River under existing authorizations; GCWA is not seeking appropriation of new water from Jones and Oyster Creeks. Instream flows in the Brazos River and flows remaining for bay and estuary inflow are a function of the flow in the Brazos River at the time of river diversion and the authorizations associated with the source water.

Based on experience with this bed and banks conveyance, the applicant anticipates changes in the quality of water conveyed through Jones and Oyster Creek due to the proposed amendment to be de minimis.

## VIII. TCEQ Comment #4

### Comment

*Explain the responses in Worksheet 4.0, items ci and cii. Based on Staff's understanding of the application, the water to be conveyed under the requested bed and banks authorization is run-of-river water authorized under Certificate of Adjudication Nos. 12-5168, 12-5171, and 12-5322, as amended. The response to item ci indicates the source of the water to be conveyed to be water originating from a surface water contract. The response in item cii indicates that other alternate sources will be discharged for conveyance in the bed and banks of Jones and Oyster Creeks. If the application requests water that is not authorized under Certificate of Adjudication Nos. 12-5168, 12-5171 and 12-5322, provide detailed information on those alternate sources and contracts.*

### Response

GCWA's use of water from the Brazos River includes diversion of flow authorized under Certificates of Adjudication 12-5168, 12-5171, and 12-5322 as well as water from the BRA diverted pursuant to a number of contracts. The applicant seeks clarification, through express incorporation of its bed and banks authorization acknowledged by TCEQ as having carried forward from pre-adjudication rights under CA 12-5168, to convey run-of-river water authorized under CA 12-5168, 12-5171, 12-5322 as well as alternate sources including:

- Existing and future BRA contracts to GCWA or facilitated by GCWA;
- Contracts identified and procured in the future from other entities; and
- Other supplies identified and procured in the future.

Information on the current BRA contracts is included in **Appendix 2**. Because Jones and Oyster Creek function as an integrated stretch of the American Canal System, the conveyance of current and future water supplies under the control of GCWA, regardless of source, is integral to the flexibility and goals described in the application.

## IX. TCEQ Comment #5

### Comment

*Remit fees in the amount of \$889.54 as described below. Please make check payable to the Texas Commission on Environmental quality or the TCEQ.*

### Response

Fees in the amount of \$889.54 will be remitted to TCEQ as specified in the December 27, 2018 letter.

## X. Other Comments

### Comment

*Note that as of December 27, 2018, one or more of the Texas Water Development Board's (TWDB) Water Use Surveys have not been received and/or declared administratively complete by the TWDB.*

### Response

GCWA has completed and submitted the TWDB 2017 Water Use Survey, which is included in **Appendix 10** to this memorandum.



## **Appendix 1**

Revised Technical Information Report Page 3

### 3. Bed and Banks. TWC § 11.042 (Instructions, Page 13)

- a. Pursuant to contract, Applicant requests authorization to convey, stored or conserved water to the place of use or diversion point of purchaser(s) using the bed and banks of a watercourse? TWC § 11.042(a). Y/N ☒

*If yes, submit a signed copy of the Water Supply Contract pursuant to 30 TAC §§ 295.101 and 297.101. Further, if the underlying Permit or Authorization upon which the Contract is based does not authorize Purchaser's requested Quantity, Purpose or Place of Use, or Purchaser's diversion point(s), then either:*

- 1. Purchaser must submit the worksheets required under Section 1 above with the Contract Water identified as an alternate source; or*
- 2. Seller must amend its underlying water right under Section 2.*

- b. Applicant requests to convey water imported into the state from a source located wholly outside the state using the bed and banks of a watercourse? TWC § 11.042(a-1). Y / N ☒

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps and fees from the list below.*

- c. Applicant requests to convey Applicant's own return flows derived from privately owned groundwater using the bed and banks of a watercourse? TWC § 11.042(b). Y / N ☒

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.*

- d. Applicant requests to convey Applicant's own return flows derived from surface water using the bed and banks of a watercourse? TWC § 11.042(c). Y / N ☒

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, Maps, and fees from the list below.*

*\*Please note, if Applicant requests the reuse of return flows belonging to others, the Applicant will need to submit the worksheets and documents under Section 1 above, as the application will be treated as a new appropriation subject to termination upon direct or indirect reuse by the return flow discharger/owner.*

- e. Applicant requests to convey water from any other source, other than (a)-(d) above, using the bed and banks of a watercourse? TWC § 11.042(c). Y / N ☒

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.*

*Worksheets and information:*

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir owned by the applicant through which water will be conveyed or diverted)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for the downstream limit of each diversion reach for the proposed conveyances)
- **Worksheet 4.0 – Discharge Information Worksheet** (for each discharge point)
- **Worksheet 5.0 – Environmental Information Worksheet**
- **Worksheet 6.0 – Water Conservation Information Worksheet**
- **Worksheet 7.0 – Accounting Plan Information Worksheet**
- **Worksheet 8.0 – Calculation of Fees; and Fees calculated – see instructions Page. 34**
- **Maps – See instructions Page. 15.**
- **Additional Documents and Worksheets may be required (see within).**

## **Appendix 2**

### **Summary of Existing BRA Contracts Diverted by GCWA**

## I. Overview

GCWA's use of water from the Brazos River includes diversion of flow authorized under Certificates of Adjudication (CA) 12-5168, 12-5171, and 12-5322 held by GCWA as well as water from the Brazos River Authority (BRA) diverted pursuant to a number of contracts and authorized under Certificates of Adjudication and water right permits held by BRA.

## II. Source Water Rights

Major authorizations held by BRA in the Brazos River Basin, including those which may be utilized to meet downstream contractual water needs, are summarized in **Table 1**.

**Table 1. BRA Authorizations**

Authorization	Type
12-5155	Reservoir (Possum Kingdom)
12-5156	Reservoir (Granbury)
12-5157	Reservoir (Whitney)
12-5158	Reservoir (Aquilla)
12-5159	Reservoir (Proctor)
12-5160	Reservoir (Belton)
12-5161	Reservoir (Stillhouse Hollow)
12-5162	Reservoir (Georgetown)
12-5163	Reservoir (Granger)
12-5164	Reservoir (Somerville)
12-5165	Reservoir (Limestone)
12-5166	Run-of-River
12-5167	Reservoir System*
12-2925	Reservoir (Allens Creek)
12-5851	Reservoir System

*\*CA 12-5167 authorizes transfer to the adjoining coastal basin at the priority of the source reservoir authorization. It does not increase total authorized diversion volume.*

### III. Contracts

GCWA's diversion of water originating from BRA authorizations is associated with multiple supply agreements and includes:

- Contracts from BRA to GCWA.
- Contracts from BRA to entities which subsequently assign their contract to GCWA or designate GCWA as their agent and rely on GCWA diversion and conveyance infrastructure.
- Contracts from BRA to other entities which retain their contracts and rely on GCWA diversion and conveyance infrastructure.
- Contracts from BRA to other entities which assign their contract or otherwise commit supply to GCWA on a temporary basis.

These BRA supply contracts vary in individual terms and conditions and range from long term contracts for firm stored water to short term interruptible supply agreements. As such, the specific contracts and volumes may vary from year to year. A summary of current BRA water supply agreements held or facilitated by GCWA as of January 2019 is included in *Table 2*.

**Table 2. Current BRA Supply Contracts**

Contract ID	Contract Holder
7401-01	Gulf Coast Water Authority
3105-02	Gulf Coast Water Authority
3105-03	Gulf Coast Water Authority
3105-17	Gulf Coast Water Authority
3105-18	Gulf Coast Water Authority
3105-19	Gulf Coast Water Authority
3105-SUBd	Pecan Grove MUD
3105-SUB 18	NRG Texas, LLC
SUGAR LAND 10	City of Sugar Land
3105-Sub 18.1	City of Rosenberg
3105-20	Brad Bulanek
3105-21	D.J. & Ashley Bulanek Farms
3105-22	Bulanek Grain & Cattle Co., LLC



Contract ID	Contract Holder
3105-23	Chris & Shari Frank Farms
3105-24	Nelson Bulanek
3105-25	Gulf Coast Farms
3105-26	CaK Farms Inc.
3105-27	Clayton Kreft
3105-28	Gage Hersey
3105-29	Noah Estrada
3105-30	Jacob Eversole
3105-31	Donald Joe, Jr & Sharon K. Bulanek
3105-32	Garrett Harvey Farms
3105-33	Casey & Jeri Smith
3105-34	Jacko & Nancy Garrett Farms
3105-35	Christian Services, LLC
3105-36	Scott Hairston
3105-37	Dean Halewyn
3105-38	Matt Frank
3105-39	Pat & Vanessa Bulanek
3105-40	Hlavinka Cattle Company, JV
3105-41	Travis Johnson
3105-42	Thomas H. Journeay, JR
3105-43	Mowery Farms
3105-44	Bonney Farms Inc.
3105-45	David & Barbara LeCompte
3105-46	Jerry & Arlene Miller, JV
3105-47	Mock Farms
3105-48	Wade & Stephanie Mock
3105-49	Ronald & Terri Duke
3105-50	Olsovsky Farms J.V.
3105-51	Vincent Peltier
3105-52	Tyler Powell

Contract ID	Contract Holder
3105-53	WRW Farms
3105-54	Max Wollam & Sons
3105-55	Matthew Robinson
3105-56	Zack Frank
3105-57	Dumesnil Farms JV
3105-58	Mark Tomlinson
3105-59	Matthew Hairston
3105-60	Loop T Loop Farms
3105-61	Seth Tomlinson
106612-01	Bieri & Son
106613-01	Jerry & Arlene Miller, JV

## **Appendix 3**

### **Worksheet 2.0**



## WORKSHEET 2.0

### Impoundment/Dam Information

This worksheet is **required** for any impoundment, reservoir and/or dam. Submit an additional Worksheet 2.0 for each impoundment or reservoir requested in this application.

*If there is more than one structure, the numbering/naming of structures should be consistent throughout the application and on any supplemental documents (e.g. maps).*

#### 1. Storage Information (Instructions, Page. 21)

- a. Official USGS name of reservoir, if applicable: N/A
- b. Provide amount of water (in acre-feet) impounded by structure at normal maximum operating level: N/A.
- c. The impoundment is on-channel N/A or off-channel N/A (mark one)
  1. Applicant has verified on-channel or off-channel determination by contacting Surface Water Availability Team at (512) 239-4691? Y / N N/A
  2. If on-channel, will the structure have the ability to pass all State Water inflows that Applicant does not have authorization to impound? Y / N N/A
- d. Is the impoundment structure already constructed? Y / N N/A
  - i. For already constructed **on-channel** structures:
    1. Date of Construction: N/A
    2. Was it constructed to be an exempt structure under TWC § 11.142? Y / N N/A
      - a. If Yes, is Applicant requesting to proceed under TWC § 11.143? Y / N N/A
      - b. If No, has the structure been issued a notice of violation by TCEQ? Y / N N/A
    3. Is it a U.S. Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service (SCS)) floodwater-retarding structure? Y / N N/A
      - a. If yes, provide the Site No. N/A and watershed project name N/A;
      - b. Authorization to close "ports" in the service spillway requested? Y / N N/A
  - ii. For any proposed new structures or modifications to structures:
    1. Applicant **must** contact TCEQ Dam Safety Section at (512) 239-0326, *prior to submitting an Application*. Applicant has contacted the TCEQ Dam Safety Section regarding the submission requirements of 30 TAC, Ch. 299? Y / N N/A  
Provide the date and the name of the Staff Person N/A
    2. As a result of Applicant's consultation with the TCEQ Dam Safety Section, TCEQ has confirmed that:
      - a. No additional dam safety documents required with the Application. Y / N N/A
      - b. Plans (with engineer's seal) for the structure required. Y / N N/A
      - c. Engineer's signed and sealed hazard classification required. Y / N N/A
      - d. Engineer's statement that structure complies with 30 TAC, Ch. 299 Rules required. Y / N N/A

3. Applicants **shall** give notice by certified mail to each member of the governing body of each county and municipality in which the reservoir, or any part of the reservoir to be constructed, will be located. (30 TAC § 295.42). Applicant must submit a copy of all the notices and certified mailing cards with this Application. Notices and cards are included? Y / N N/A
- iii. Additional information required for **on-channel** storage:
1. Surface area (in acres) of on-channel reservoir at normal maximum operating level: N/A.
  2. Based on the Application information provided, Staff will calculate the drainage area above the on-channel dam or reservoir. If Applicant wishes to also calculate the drainage area they may do so at their option.  
Applicant has calculated the drainage area. Y/N N/A  
If yes, the drainage area is N/A sq. miles.  
(If assistance is needed, call the Surface Water Availability Team prior to submitting the application, (512) 239-4691).

## 2. Structure Location (Instructions, Page. 23)

- a. On Watercourse (if on-channel) (USGS name): N/A
- b. Zip Code: N/A
- c. In the N/A Original Survey No. N/A, Abstract No. N/A, N/A County, Texas.  
*\* A copy of the deed(s) with the recording information from the county records must be submitted describing the tract(s) that include the structure and all lands to be inundated.*  
*\*\*If the Applicant is not currently the sole owner of the land on which the structure is or will be built and sole owner of all lands to be inundated, Applicant must submit documentation evidencing consent or other documentation supporting Applicant's right to use the land described.*
- d. A point on the centerline of the dam (on-channel) or anywhere within the impoundment (off-channel) is:  
Latitude N/A °N, Longitude N/A °W.  
*\*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- di. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): N/A
- dii. Map submitted which clearly identifies the Impoundment, dam (where applicable), and the lands to be inundated. See instructions Page. 15. Y / N N/A

## **Appendix 4**

Revised Worksheet 3.0 Forms for Proposed Upstream  
and Downstream Reach Limits



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is required for each diversion point or diversion reach. Submit one Worksheet 3.0 for each diversion point and two Worksheets for each diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. GCWA Point #1a Upstream Limit of Diversion Reach No.
3. N/A Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for this new point <sup>900</sup>\_\_\_\_\_ cfs (cubic feet per second)  
or <sup>405,000</sup>\_\_\_\_\_ gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / NY  
If yes, submit Maximum **Combined Rate of Diversion** for all points/reaches <sup>900</sup>\_\_\_\_\_ cfs or <sup>405,000</sup>\_\_\_\_\_ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / NN

**\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.**

e. Check (√) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / NN

If yes, the drainage area is <sup>N/A</sup>\_\_\_\_\_ sq. miles.

(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77406
- c. Location of point: In the Churchill Fulshear Grant Original Survey No. N/A, Abstract No. 29, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.646223°N, Longitude 95.902478°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. N/A Upstream Limit of Diversion Reach No.
3. GCWA Point #1b Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** <sup>900</sup>\_\_\_\_\_ cfs (cubic feet per second)  
or <sup>405,000</sup>\_\_\_\_\_ gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / N Y  
*If yes, submit Maximum **Combined Rate of Diversion** for all points/reaches* <sup>900</sup>\_\_\_\_\_ cfs or <sup>405,000</sup>\_\_\_\_\_ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / N N

**\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.**

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / N N

If yes, the drainage area is <sup>N/A</sup>\_\_\_\_\_ sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*



## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77406
- c. Location of point: In the Churchill Fulshear Grant Original Survey No. N/A, Abstract No. 29, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.639858°N, Longitude 95.902208°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. GCWA Point #2a Upstream Limit of Diversion Reach No.
3. N/A Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** <sup>900</sup>\_\_\_\_\_ cfs (cubic feet per second)  
or <sup>405,000</sup>\_\_\_\_\_ gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / N Y  
*If yes, submit Maximum Combined Rate of Diversion for all points/reaches* <sup>900</sup>\_\_\_\_\_ cfs or <sup>405,000</sup>\_\_\_\_\_ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / N N

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / N N

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*



## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77459
- c. Location of point: In the Thomas Barnett Grant Original Survey No. N/A, Abstract No. 7, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.504152°N, Longitude 95.554569°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. N/A Upstream Limit of Diversion Reach No.
3. GCWA Point #2b Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** <sup>900</sup>\_\_\_\_\_ cfs (cubic feet per second)  
or <sup>405,000</sup>\_\_\_\_\_ gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / N Y  
*If yes, submit Maximum Combined Rate of Diversion for all points/reaches* <sup>900</sup>\_\_\_\_\_ cfs or <sup>405,000</sup>\_\_\_\_\_ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / N N

**\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.**

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / N N

If yes, the drainage area is <sup>N/A</sup>\_\_\_\_\_ sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77459
- c. Location of point: In the Thomas Barnett Grant Original Survey No. N/A, Abstract No. 7, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.502976°N, Longitude 95.552743°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.  
N/A



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is required for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. GCWA Point #3a Upstream Limit of Diversion Reach No.
3. N/A Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** <sup>900</sup>\_\_\_\_\_ cfs (cubic feet per second)  
or <sup>405,000</sup>\_\_\_\_\_ gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / N Y  
*If yes, submit Maximum Combined Rate of Diversion for all points/reaches* <sup>900</sup>\_\_\_\_\_ cfs or <sup>405,000</sup>\_\_\_\_\_ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / N N

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / N N

If yes, the drainage area is <sup>N/A</sup>\_\_\_\_\_ sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77533
- c. Location of point: In the William Pettus Grant Original Survey No. N/A, Abstract No. 58, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.458278°N, Longitude 95.532664°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is required for each diversion point or diversion reach. Submit one Worksheet 3.0 for each diversion point and two Worksheets for each diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. N/A Upstream Limit of Diversion Reach No.
3. GCWA Point #3b Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for this new point <sup>900</sup>\_\_\_\_\_ cfs (cubic feet per second)  
or <sup>405,000</sup>\_\_\_\_\_ gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / NY  
*If yes, submit Maximum Combined Rate of Diversion for all points/reaches* <sup>900</sup>\_\_\_\_\_ cfs or <sup>405,000</sup>\_\_\_\_\_ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / NN

**\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.**

e. Check (√) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / NN

If yes, the drainage area is <sup>N/A</sup>\_\_\_\_\_ sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*



## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77583
- c. Location of point: In the William Pettus Grant Original Survey No. N/A, Abstract No. 69, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.455055°N, Longitude 95.533160°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## **Appendix 5**

### Canal Documentation



## **Appendix 5-A**

TCEQ Letter

Bryan W. Shaw, Ph.D., *Chairman*  
Carlos Rubinstein, *Commissioner*  
Toby Baker, *Commissioner*  
Zak Covar, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

September 14, 2012

Ms. Molly Cagle, Partner  
Baker Botts L.L.P.  
98 San Jacinto Boulevard, Suite 1500  
Austin, Texas 78701

Re: Gulf Coast Water Authority; Certificate of Adjudication No. 12-5168

Dear Ms. <sup>Molly</sup>~~Cagle~~:

We have reviewed the request from Gulf Coast Water Authority (GCWA) concerning Certificate of Adjudication No. 12-5168, which was issued after the adjudication of Permit No. 1040, and the right to use the bed and banks of Jones and Oyster Creeks. As stated in the Adjudication Engineer's Report, Permit No. 1040, issued in 1927, authorized the use of the "channel and banks" of Jones and Oyster Creeks for the conveyance of water.

The Final Determination in the Brazos River Basin and Brazos-San Jacinto Coastal Basin (Final Determination) dated June 26, 1985, includes section 5(c), which states, in part, that all of the terms and conditions stated in permits or amended certified filings shall continue in full force and effect, except for obsolete, irrelevant or immaterial terms and conditions. The Final Judgment and Decree of the 26<sup>th</sup> Judicial District of Williamson County (Final Decree) entered November 24, 1986, affirmed the Final Determination. Therefore, I confirm that, based on the Final Determination and the Final Decree, GCWA is authorized to use the bed and banks of Jones and Oyster Creeks.

If you have any questions, please don't hesitate to call me at 512/239-0665.

Sincerely,

A handwritten signature in cursive script, appearing to read "Caroline M. Sweeney".

Caroline M. Sweeney  
Deputy Director  
Office of Legal Services

## **Appendix 5-B**

### Historical Survey Documents



I CERTIFY THAT SHEETS NO 2 TO  
NO 7 INCL. CORRECTLY REPRESENTS  
RESULTS OF COMPUTATIONS OR  
SURVEYS MADE BY ME AND  
COMPLETED October 21, 1935

In support of application dated 1-11-1934 for  
amended permit 1930 (and subsequent amendments)  
submitted by United States Irrigation Co. now  
American Canal Co. to appropriate certain  
waters of the unappropriated waters of the  
State of Texas

ACCEPTED FOR FILING IN THE OFFICE OF THE  
BOARD OF WATER ENGINEERS OF TEXAS ON  
THE \_\_\_\_\_ DAY OF \_\_\_\_\_

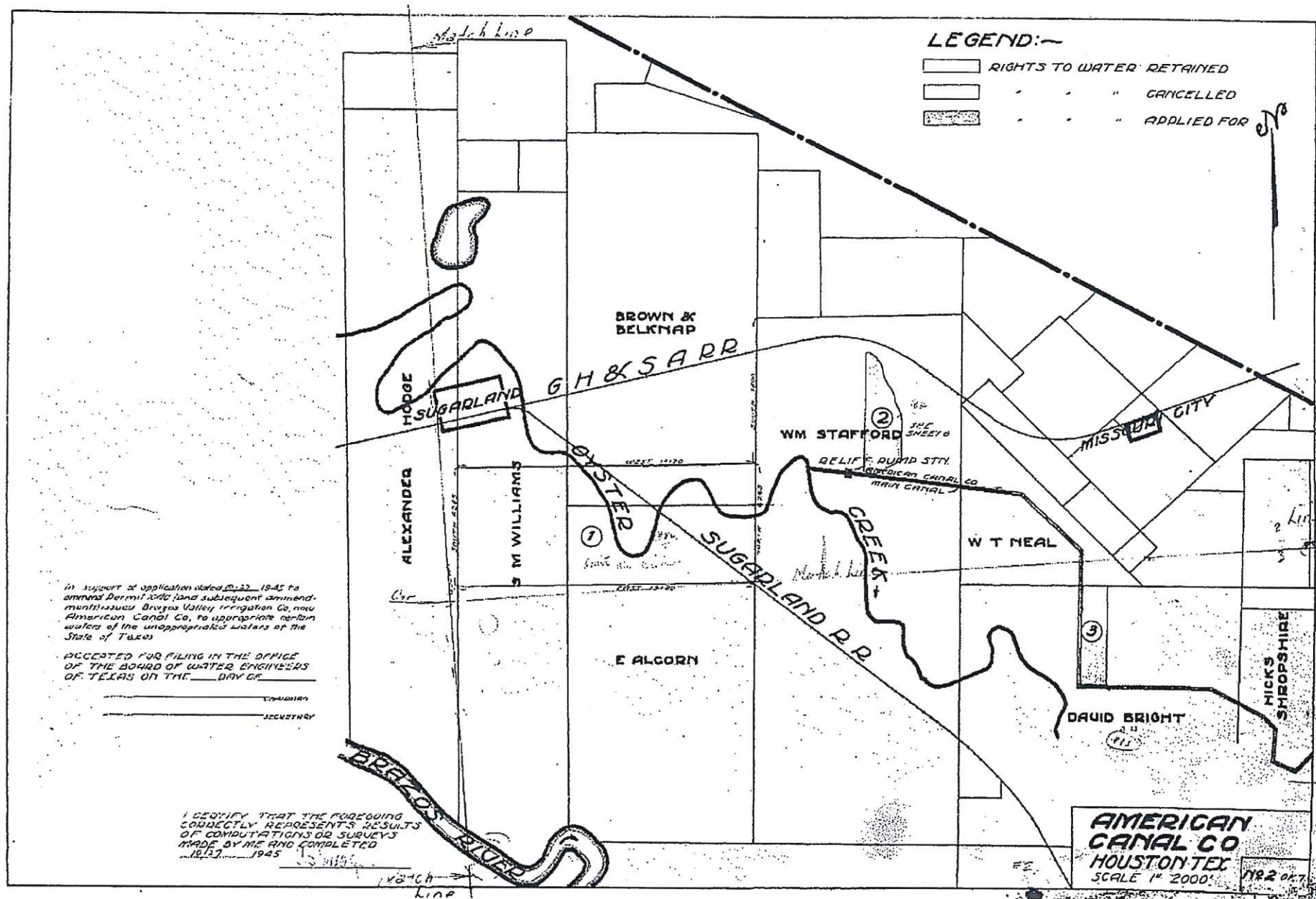
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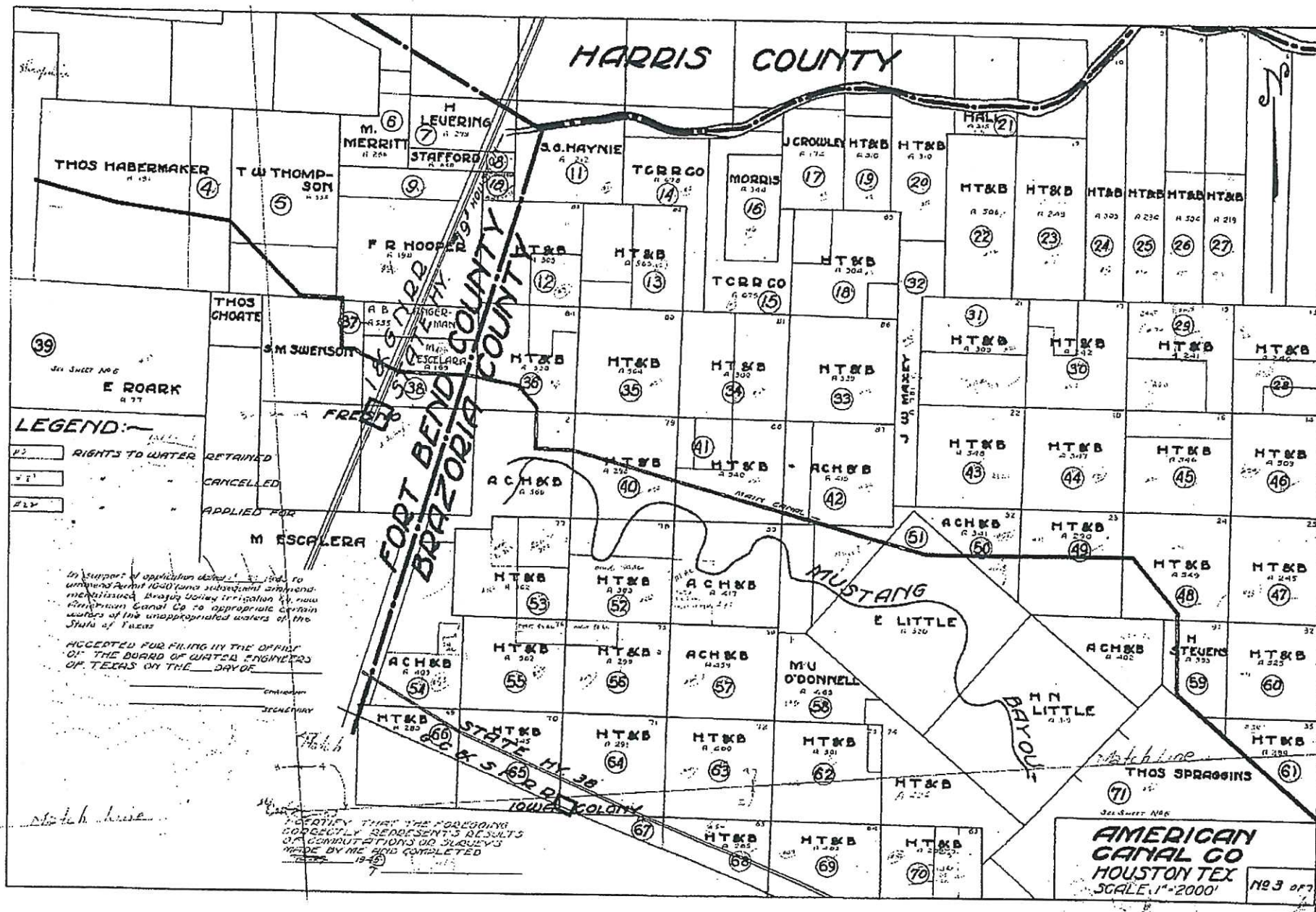
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SECRETARY

**AMERICAN  
CANAL CO**  
HOUSTON TEX  
SCALE 1" = 10,000'

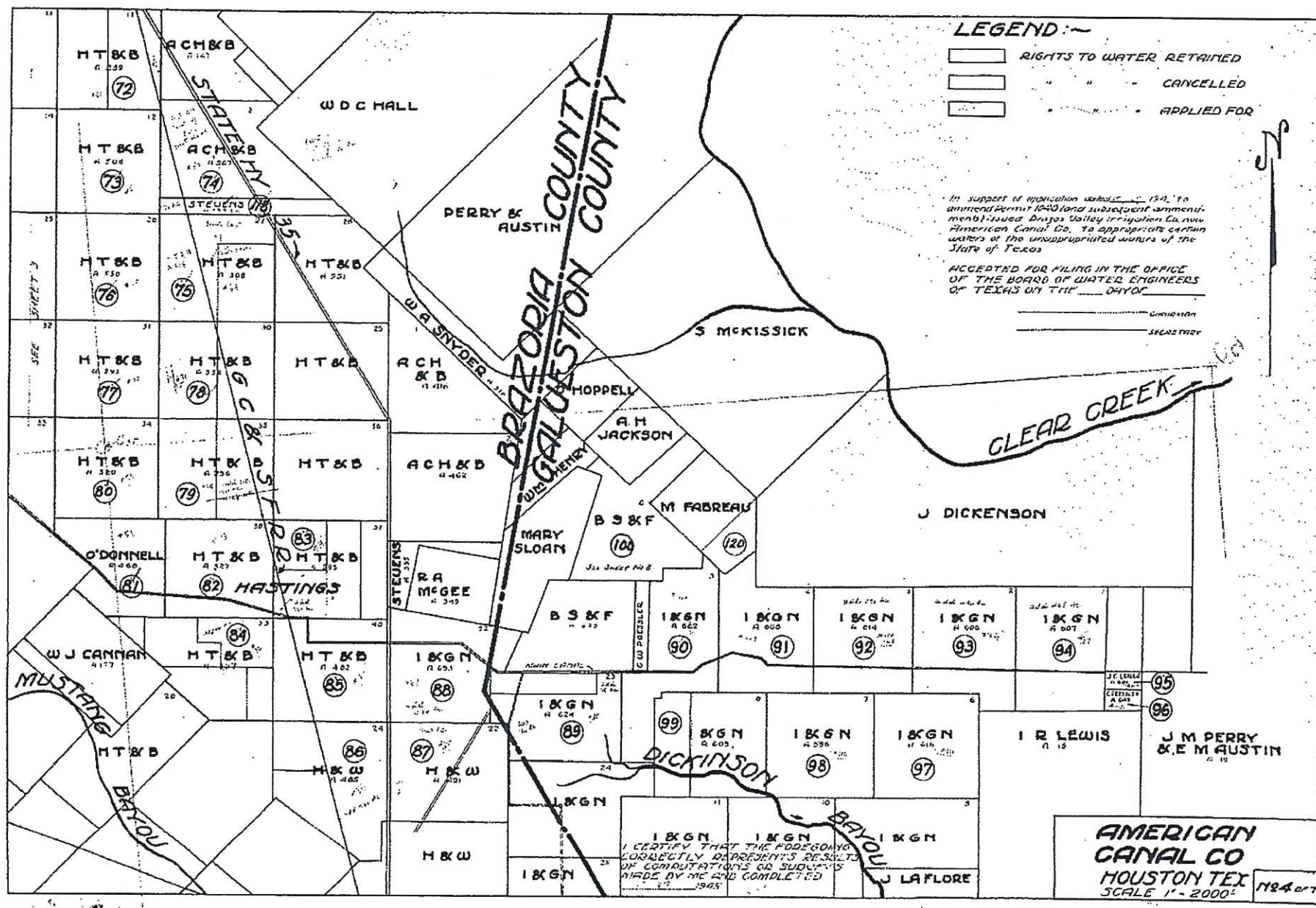
INDEX  
MAP  
No 7 of 7

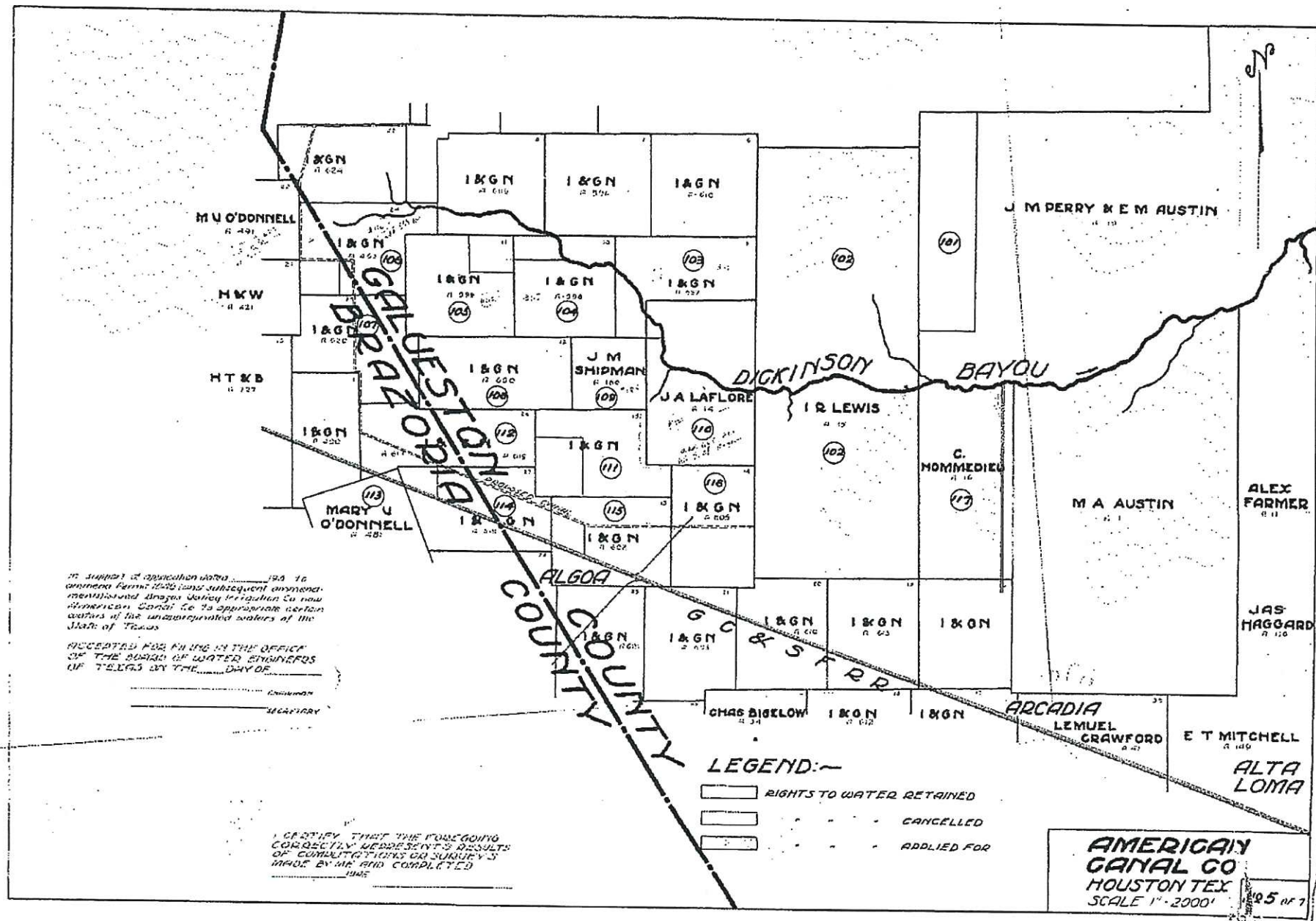








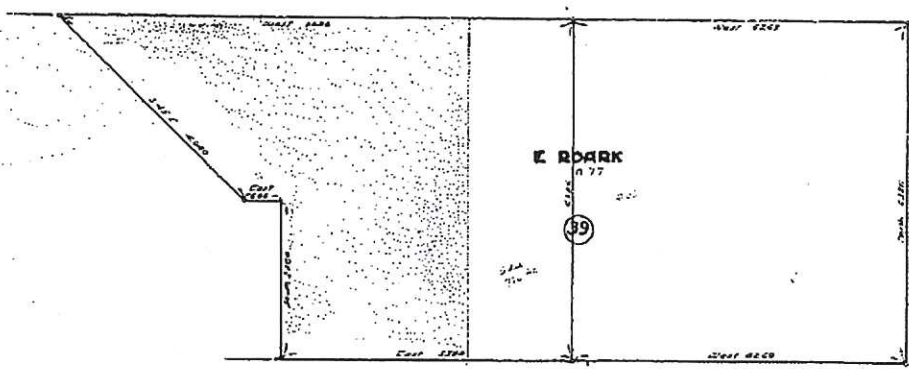
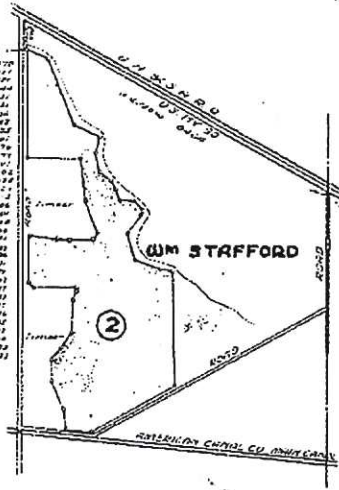






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point of reference

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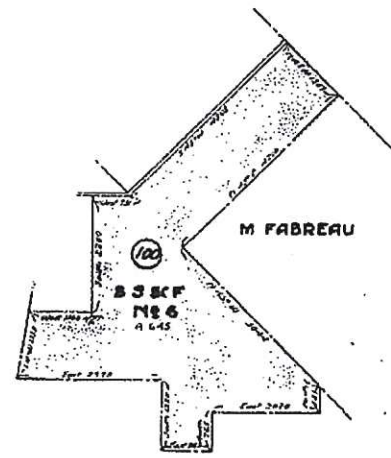
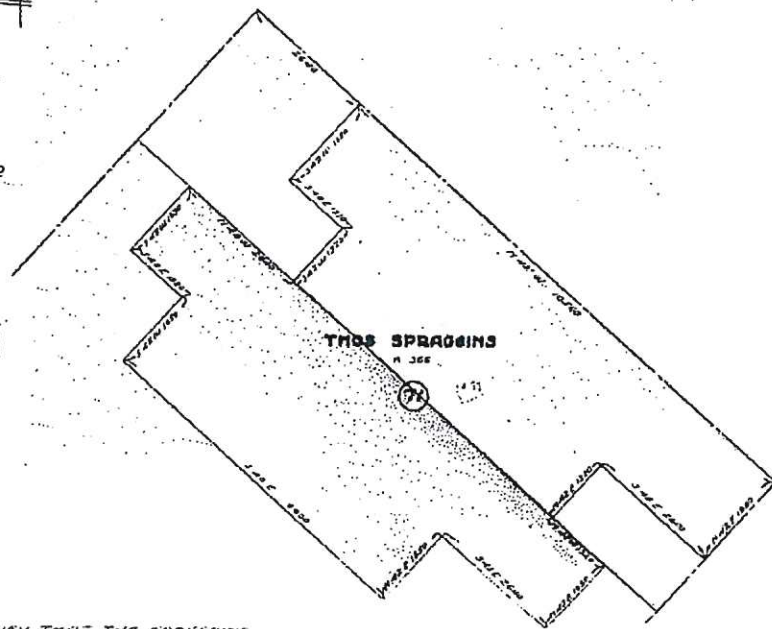
**LEGEND:-**

- RIGHTS TO WATER RETAINED
- CANCELLED
- APPLIED FOR

In support of application dated 1961 to amend Permit 1040 (and subsequent amendments) issued Brazos Valley Irrigation Canal American Canal Co. to appropriate certain waters of the unappropriated waters of the State of Texas.

RESERVED FOR FILING IN THE OFFICE OF THE BOARD OF WATER ENGINEERS OF TEXAS ON THE DAY OF

CHIEF ENGINEER  
SECRETARY



I CERTIFY THAT THE FOREGOING EXACTLY REPRESENTS RESULTS OF CONDUCTED SURVEYS MADE BY ME AND SUBMITTED

**AMERICAN CANAL CO**  
HOUSTON TEX  
SCALE 1" = 1000'  
1146

SHEET NO.	SURVEY	ACS	DATE	ADJ	ADJ	TOTAL	DESCRIPTION
226	1. S. M. GILLIAMS	29	1947	218		218	SEE SHEET 6
2	2. W. STAFFORD	15		180		180	ALONG EAST SIDE OF CANAL
3	3. T. HARRINGTON	191		190		381	EAST 300
4	4. T. HARRINGTON	335	194	332		667	THIRTY 322
5	5. M. MERRITT	286		104		390	ALL
6	6. M. L. FERRING	279		300		579	ALL
7	7. STAFFORD	268		173		441	EXCEPT SOUTH 40 WEST OF RR
8	8. F. D. MOORE	198	194	247		445	ALL
9	9. McDONALD	457		64		521	ALL SOUTH OF CLEAR CREEK
10	10. S. HAYME	212		300		512	ALL
11	11. T. & B	83	180	180		263	EAST 1/2
12	12. T. & B	52	505	60		617	ALL
13	13. T. & B	4	674			678	ALL
14	14. M. DODD	140		420		560	ALL
15	15. J. CROWLEY	173		320		493	ALL
16	16. T. & B	85	304	192		581	EXCEPT NORTH 1/2 OF WEST 1/2 1/2 OF E 1/2
17	17. T. & B	1	570			571	SOUTH 1/2
18	18. T. & B	1	310			311	ALL SOUTH OF CLEAR CREEK
19	19. T. & B	215		120		335	ALL
20	20. T. & B	70	508			578	ALL
21	21. T. & B	19	249			268	ALL
22	22. T. & B	10	505			515	ALL
23	23. T. & B	9	524			533	ALL
24	24. T. & B	4	504			508	ALL
25	25. T. & B	13	270			283	ALL
26	26. T. & B	13	220	220		440	ALL
27	27. T. & B	15	241	540		796	ALL
28	28. T. & B	17	242	120		362	EXCEPT NW 40 & EAST 80 OF NW 1/4
29	29. T. & B	21	509	320		829	ALL
30	30. J. W. MURLEY	281	404			685	NONE
31	31. T. & B	86	529			615	ALL
32	32. T. & B	91	300			391	WEST 1/2
33	33. T. & B	20	564			584	ALL
34	34. T. & B	84	539	120		659	EXCEPT NORTH 80 OF NW 1/4 & NW 40 OF NE 1/4
35	35. R. L. LANGERMAN	335		227		562	ALL
36	36. M. ESCAL	169	475			644	NONE
37	37. R. BARK	71	320	120		411	SEE SHEET 6
38	38. T. & B	19	288	320		608	ALL NORTH OF CANAL
39	39. T. & B	81	301	70		371	WEST 1/2 NORTH OF CANAL
40	40. T. & B	81	173	160		333	EXCEPT WEST 1/2
41	41. T. & B	22	540			562	ALL
42	42. T. & B	18	574			592	ALL
43	43. T. & B	16	546	160		706	SOUTH 1/2
44	44. T. & B	14	505			519	ALL
45	45. T. & B	23	543			566	ALL
46	46. T. & B	23	529	90		619	ALL NORTH & EAST OF CANAL
47	47. T. & B	32	571	302		873	ALL NORTH OF CANAL
48	48. E. LITTLE	320		90		410	ALL
49	49. T. & B	78	383	130		513	SOUTH 1/2
50	50. T. & B	71	202	160		362	EAST 1/2
51	51. T. & B	1	403	130		533	SOUTH 1/2
52	52. T. & B	76	284	20		304	EXCEPT NORTH 80 OF NE 1/4
53	53. T. & B	75	295	20		315	EXCEPT NORTH 1/2 OF NW 1/4
54	54. T. & B	30	523			553	ALL
55	55. M. O'DONNELL	263		400		663	SOUTH 1/2
56	56. H. STEVENSON	593		320		913	ALL
57	57. T. & B	32	524			556	ALL

SHEET NO.	SURVEY	ACS	DATE	ADJ	ADJ	TOTAL	DESCRIPTION
3	3. T. & B	33	200			233	ALL
4	4. T. & B	73	301	40		411	EXCEPT 40 OF NE 1/4
5	5. T. & B	73	468			541	ALL
6	6. T. & B	71	551			622	ALL
7	7. T. & B	70	505			575	ALL NORTH OF RR
8	8. T. & B	69	270	197		467	ALL
9	9. T. & B	66	560	80		640	ALL
10	10. T. & B	65	283			348	ALL
11	11. T. & B	64	403			467	ALL
12	12. T. & B	63	289			352	WEST 1/2
13	13. T. & B	58	320	650		1028	NE 1/4 EXCEPT 600 AC. SEE SHEET 6
14	14. T. & B	57	320	50		570	EAST 1/2 WEST OF RR
15	15. T. & B	56	308			564	ALL
16	16. T. & B	55	307	262		569	ALL WEST OF RR
17	17. T. & B	54	267	166		433	ALL
18	18. T. & B	53	550			550	ALL
19	19. T. & B	52	533			533	ALL
20	20. T. & B	51	532			532	WEST 1/2
21	21. T. & B	50	525			525	ALL
22	22. T. & B	49	520			520	ALL
23	23. T. & B	48	510			510	ALL
24	24. T. & B	47	505			505	ALL
25	25. T. & B	46	500			500	ALL
26	26. T. & B	45	495			495	ALL
27	27. T. & B	44	490			490	ALL
28	28. T. & B	43	485			485	ALL
29	29. T. & B	42	480			480	ALL
30	30. T. & B	41	475			475	ALL
31	31. T. & B	40	470			470	ALL
32	32. T. & B	39	465			465	ALL
33	33. T. & B	38	460			460	ALL
34	34. T. & B	37	455			455	ALL
35	35. T. & B	36	450			450	ALL
36	36. T. & B	35	445			445	ALL
37	37. T. & B	34	440			440	ALL
38	38. T. & B	33	435			435	ALL
39	39. T. & B	32	430			430	ALL
40	40. T. & B	31	425			425	ALL
41	41. T. & B	30	420			420	ALL
42	42. T. & B	29	415			415	ALL
43	43. T. & B	28	410			410	ALL
44	44. T. & B	27	405			405	ALL
45	45. T. & B	26	400			400	ALL
46	46. T. & B	25	395			395	ALL
47	47. T. & B	24	390			390	ALL
48	48. T. & B	23	385			385	ALL
49	49. T. & B	22	380			380	ALL
50	50. T. & B	21	375			375	ALL
51	51. T. & B	20	370			370	ALL
52	52. T. & B	19	365			365	ALL
53	53. T. & B	18	360			360	ALL
54	54. T. & B	17	355			355	ALL
55	55. T. & B	16	350			350	ALL
56	56. T. & B	15	345			345	ALL
57	57. T. & B	14	340			340	ALL
58	58. T. & B	13	335			335	ALL
59	59. T. & B	12	330			330	ALL
60	60. T. & B	11	325			325	ALL
61	61. T. & B	10	320			320	ALL
62	62. T. & B	9	315			315	ALL
63	63. T. & B	8	310			310	ALL
64	64. T. & B	7	305			305	ALL
65	65. T. & B	6	300			300	ALL
66	66. T. & B	5	295			295	ALL
67	67. T. & B	4	290			290	ALL
68	68. T. & B	3	285			285	ALL
69	69. T. & B	2	280			280	ALL
70	70. T. & B	1	275			275	ALL
71	71. T. & B	0	270			270	ALL
72	72. T. & B	0	265			265	ALL
73	73. T. & B	0	260			260	ALL
74	74. T. & B	0	255			255	ALL
75	75. T. & B	0	250			250	ALL
76	76. T. & B	0	245			245	ALL
77	77. T. & B	0	240			240	ALL
78	78. T. & B	0	235			235	ALL
79	79. T. & B	0	230			230	ALL
80	80. T. & B	0	225			225	ALL
81	81. T. & B	0	220			220	ALL
82	82. T. & B	0	215			215	ALL
83	83. T. & B	0	210			210	ALL
84	84. T. & B	0	205			205	ALL
85	85. T. & B	0	200			200	ALL
86	86. T. & B	0	195			195	ALL
87	87. T. & B	0	190			190	ALL
88	88. T. & B	0	185			185	ALL
89	89. T. & B	0	180			180	ALL
90	90. T. & B	0	175			175	ALL
91	91. T. & B	0	170			170	ALL
92	92. T. & B	0	165			165	ALL
93	93. T. & B	0	160			160	ALL
94	94. T. & B	0	155			155	ALL
95	95. T. & B	0	150			150	ALL
96	96. T. & B	0	145			145	ALL
97	97. T. & B	0	140			140	ALL
98	98. T. & B	0	135			135	ALL
99	99. T. & B	0	130			130	ALL
100	100. T. & B	0	125			125	ALL
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103	103. T. & B	0	110			110	ALL
104	104. T. & B	0	105			105	ALL
105	105. T. & B	0	100			100	ALL
106	106. T. & B	0	95			95	ALL
107	107. T. & B	0	90			90	ALL
108	108. T. & B	0	85			85	ALL
109	109. T. & B	0	80			80	ALL
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123	123. T. & B	0	10			10	ALL
124	124. T. & B	0	5			5	ALL
125	125. T. & B	0	0			0	ALL

TOTAL ACRES OMITTED 4923

ADDED 4923  
RETAINED 3641  
THIS PERMIT 49265

In support of application dated 12-27-1945 for  
university permit 1040 (and subsequent amendments)  
submitted by Texas Valley Irrigation Co., now  
American Canal Co., to appropriate certain  
waters of the unappropriated waters of the  
State of Texas

ACCEPTED FOR FILING IN THE OFFICE  
OF THE BOARD OF WATER ENGINEERS  
OF TEXAS ON THE \_\_\_\_ DAY OF \_\_\_\_

CHIEF

SECRETARY

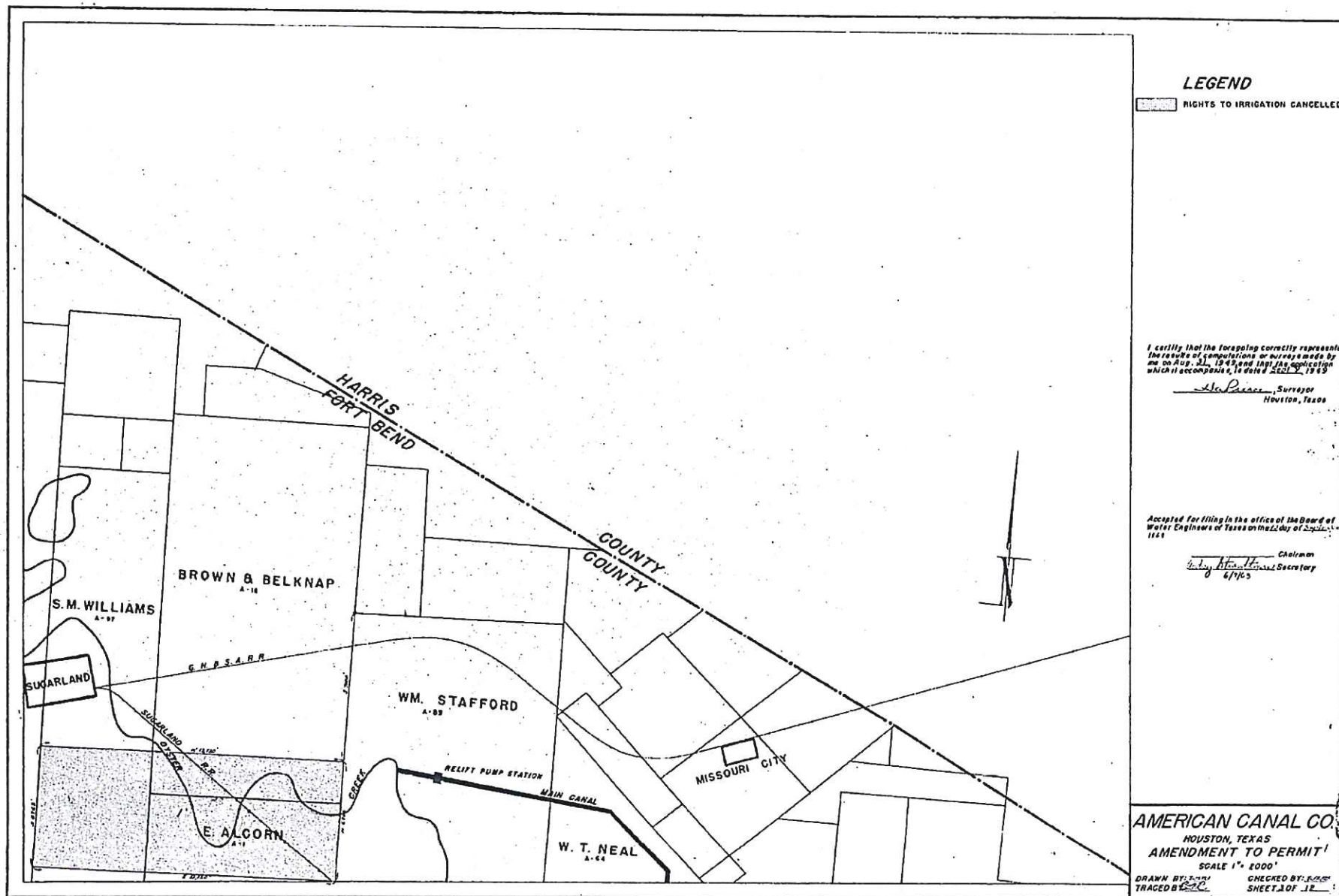
I CERTIFY THAT THE FOREGOING  
CORRECTLY REPRESENTS RESULTS  
OF











# LEGEND

RIGHTS TO IRRIGATION CANCELLED

I certify that the foregoing correctly represents the results of computations or surveys made by me on Aug. 31, 1945, and that the application which it accompanies, is dated 2/28/49

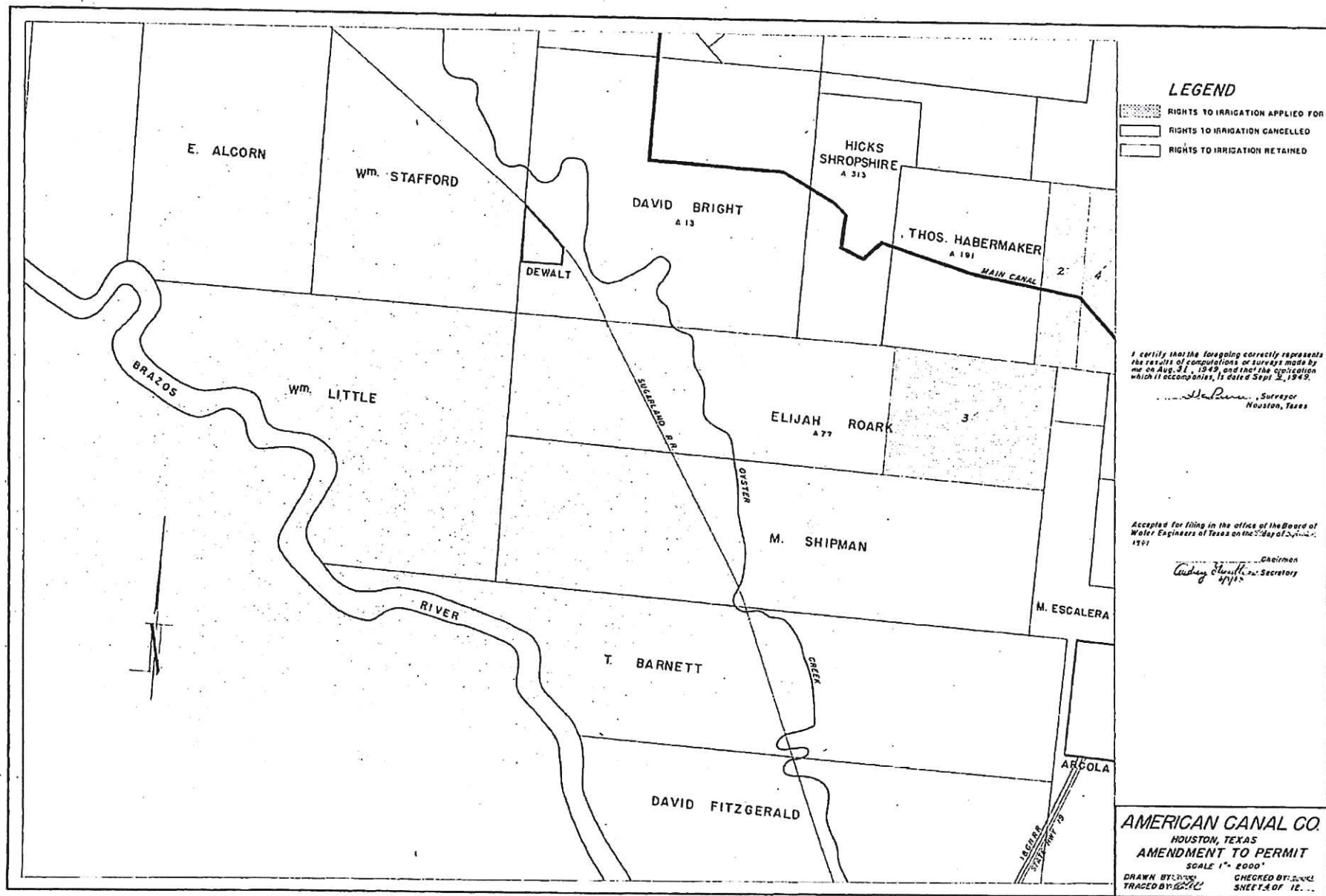
*John P. Reese*, Surveyor  
Houston, Texas

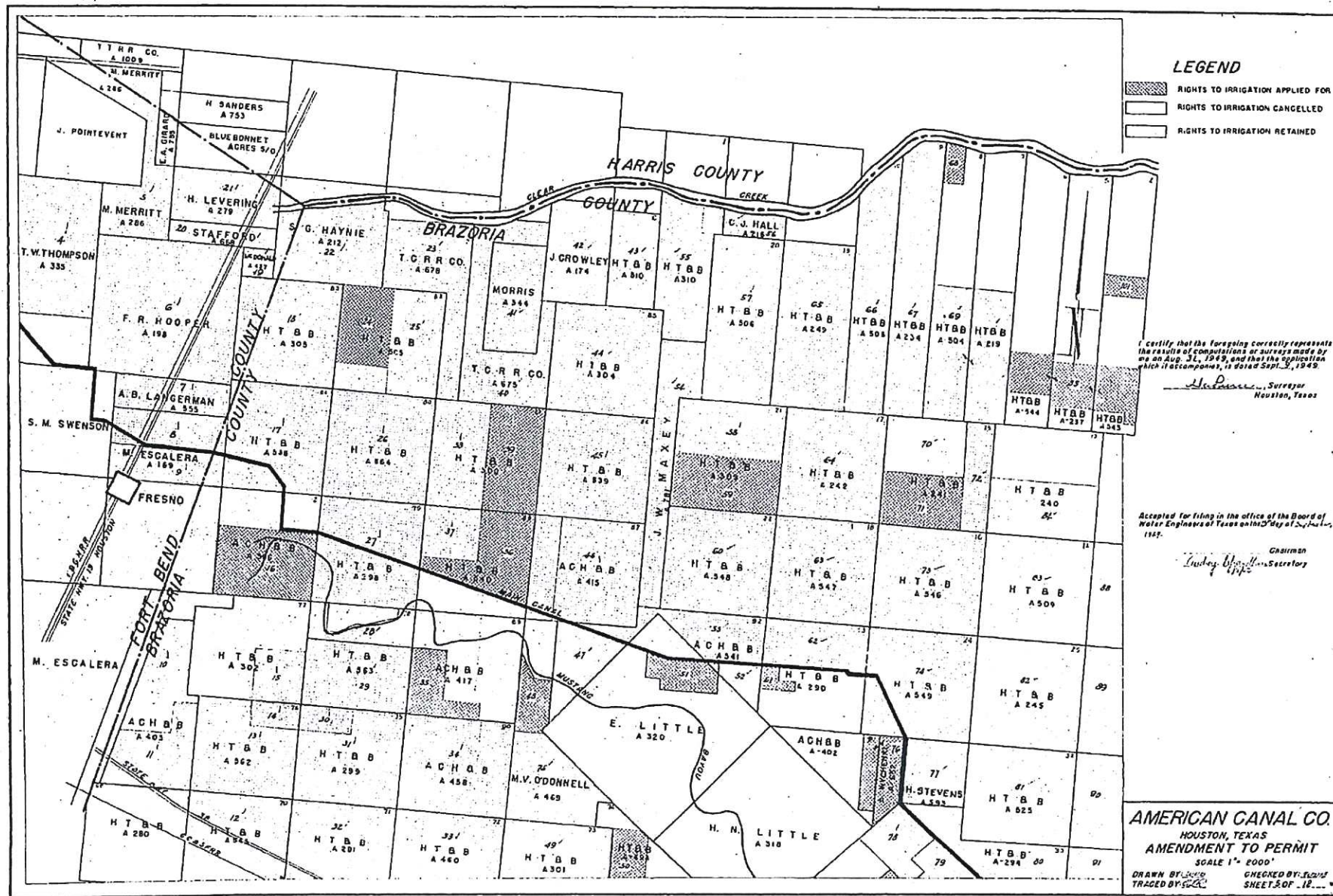
Accepted for filing in the office of the Board of Water Engineers of Texas on the 22nd day of August, 1945

*John H. Hines*, Chairman  
6/7/45 Secretary

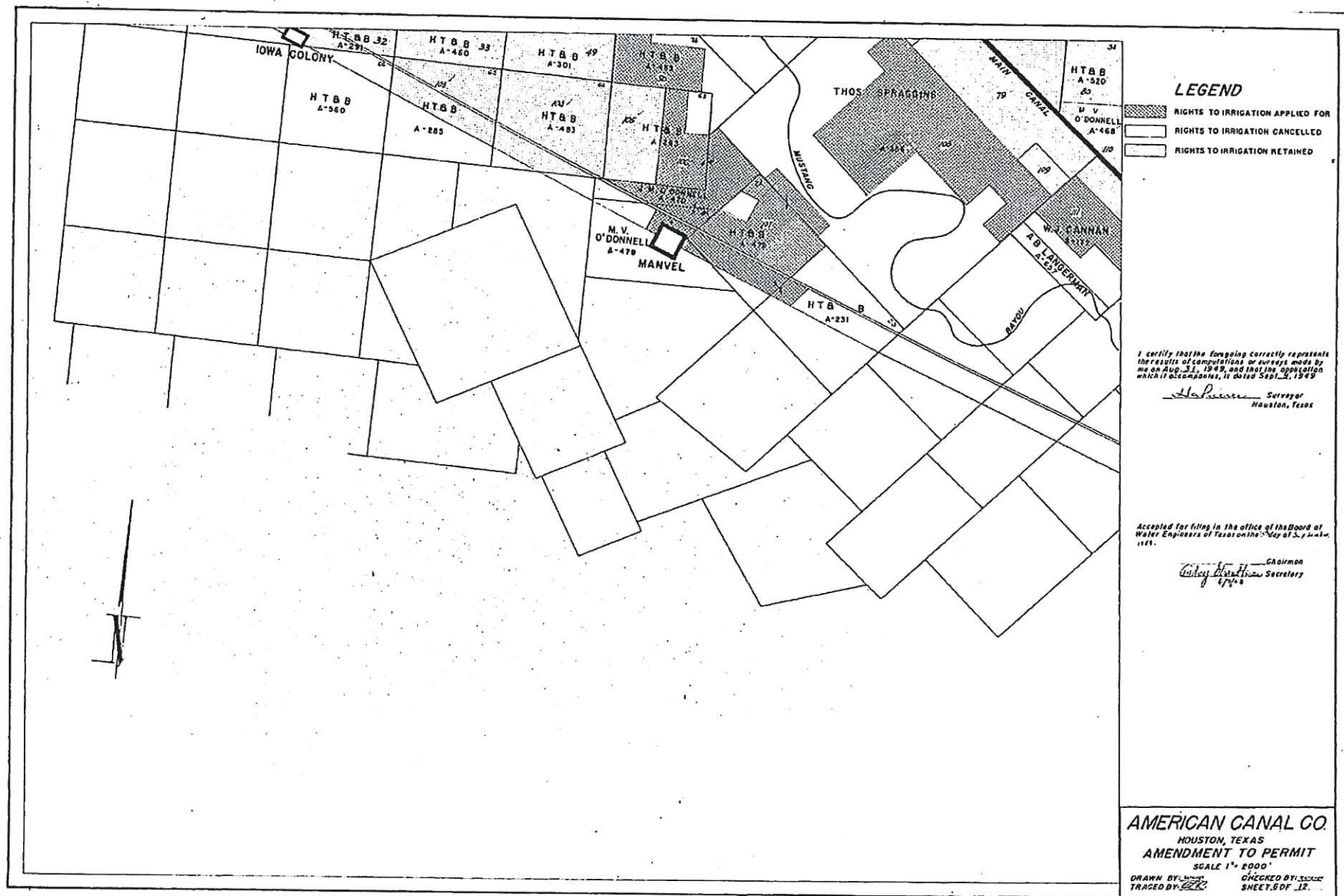
AMERICAN CANAL CO.  
HOUSTON, TEXAS  
AMENDMENT TO PERMIT  
SCALE 1" = 2000'  
DRAWN BY: J. H. HINES  
TRACED BY: J. H. HINES  
CHECKED BY: J. H. HINES  
SHEET 1 OF 12



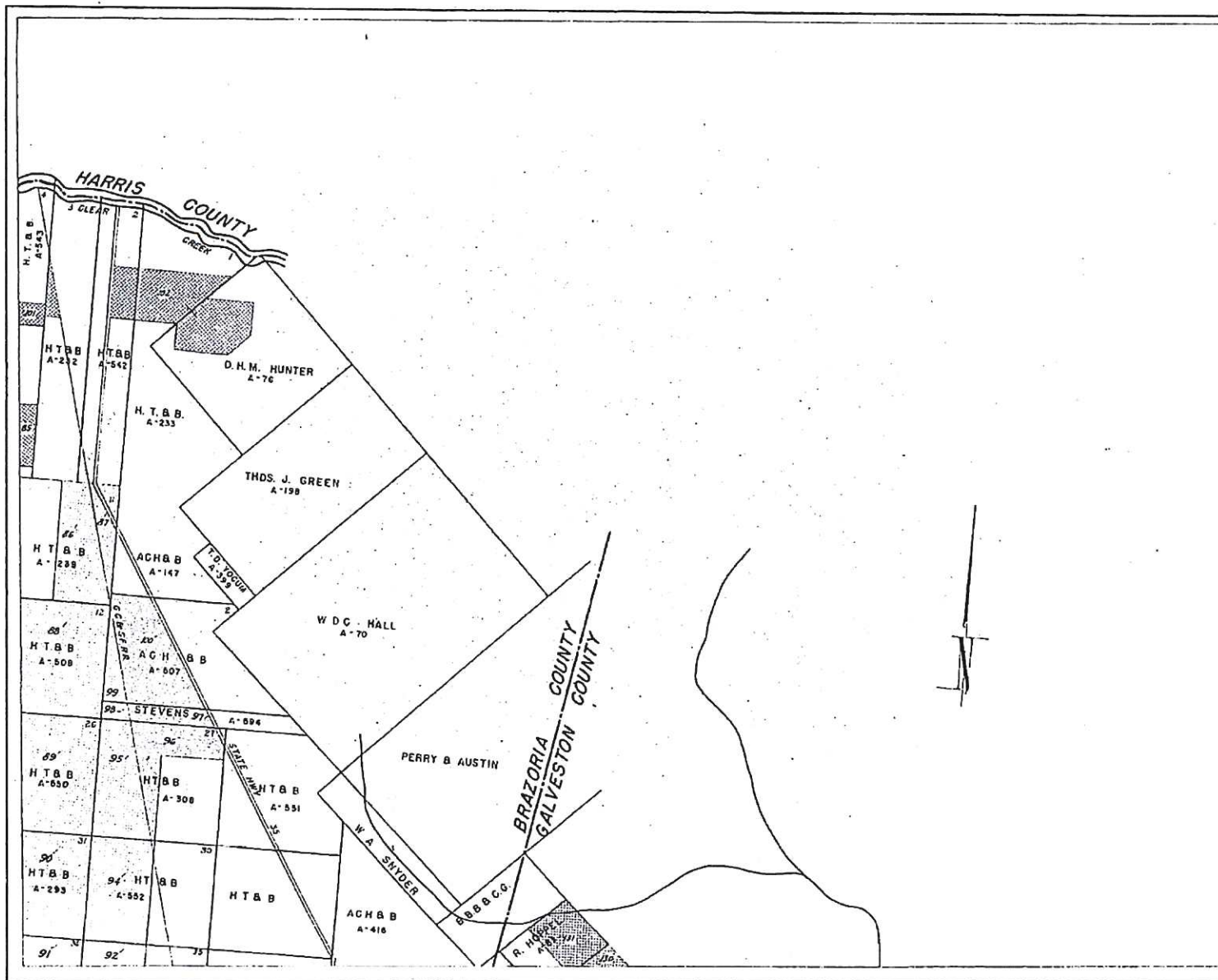












# LEGEND

- RIGHTS TO IRRIGATION APPLIED FOR
- RIGHTS TO IRRIGATION CANCELLED
- RIGHTS TO IRRIGATION RETAINED

I certify that the foregoing correctly represents the results of computations or surveys made by me on AUG 31, 1949, and that the application which it accompanies, is dated SEPT. 2, 1949.

H. P. [Signature], Surveyor  
Houston, Texas

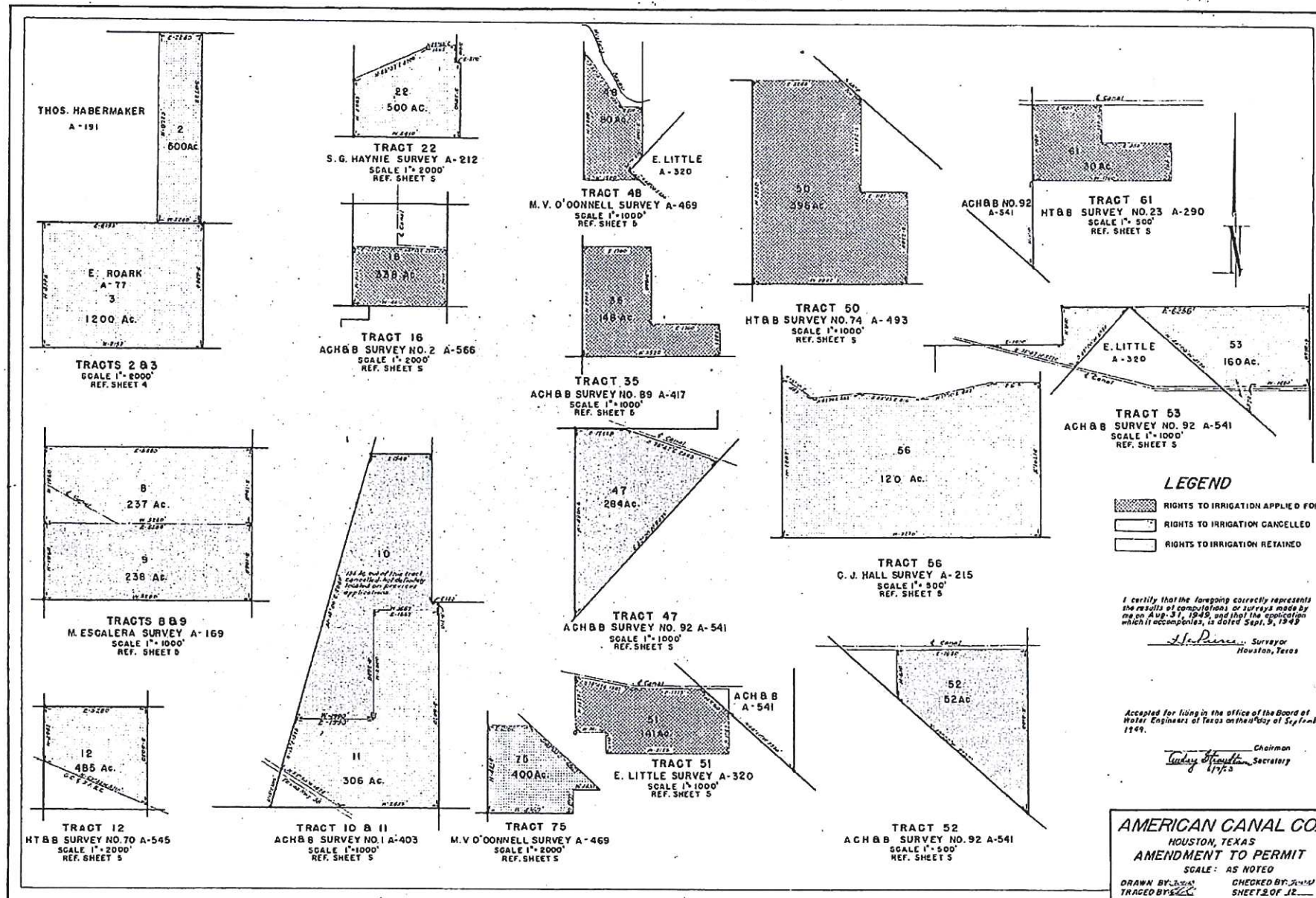
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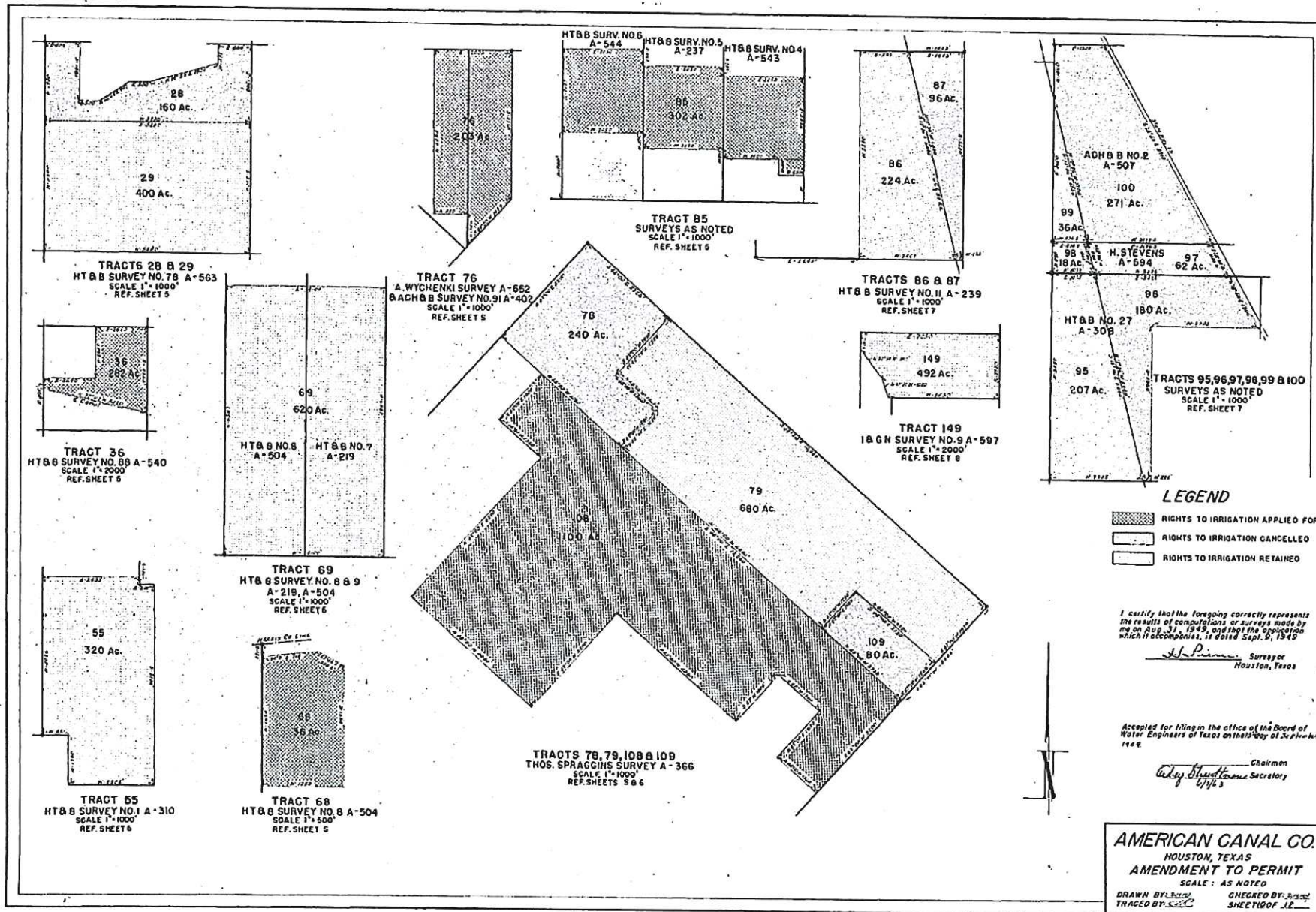
[Signature] Chairman  
Secretary

**AMERICAN CANAL CO.**  
HOUSTON, TEXAS  
**AMENDMENT TO PERMIT**  
SCALE 1" = 2000'  
DRAWN BY: J. W. [Signature] CHECKED BY: J. W. [Signature]  
TRACED BY: [Signature] SHEET 2 OF 12







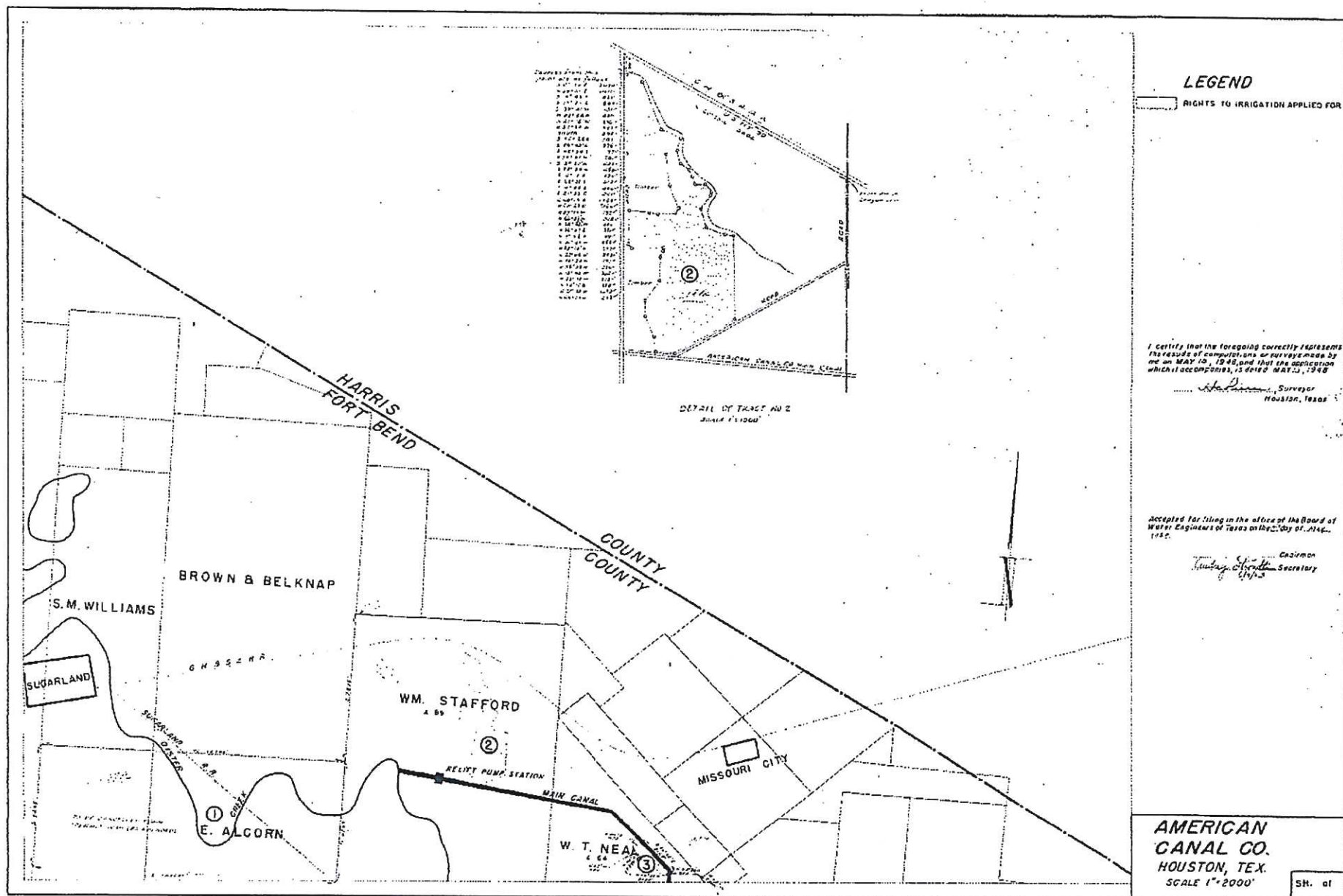




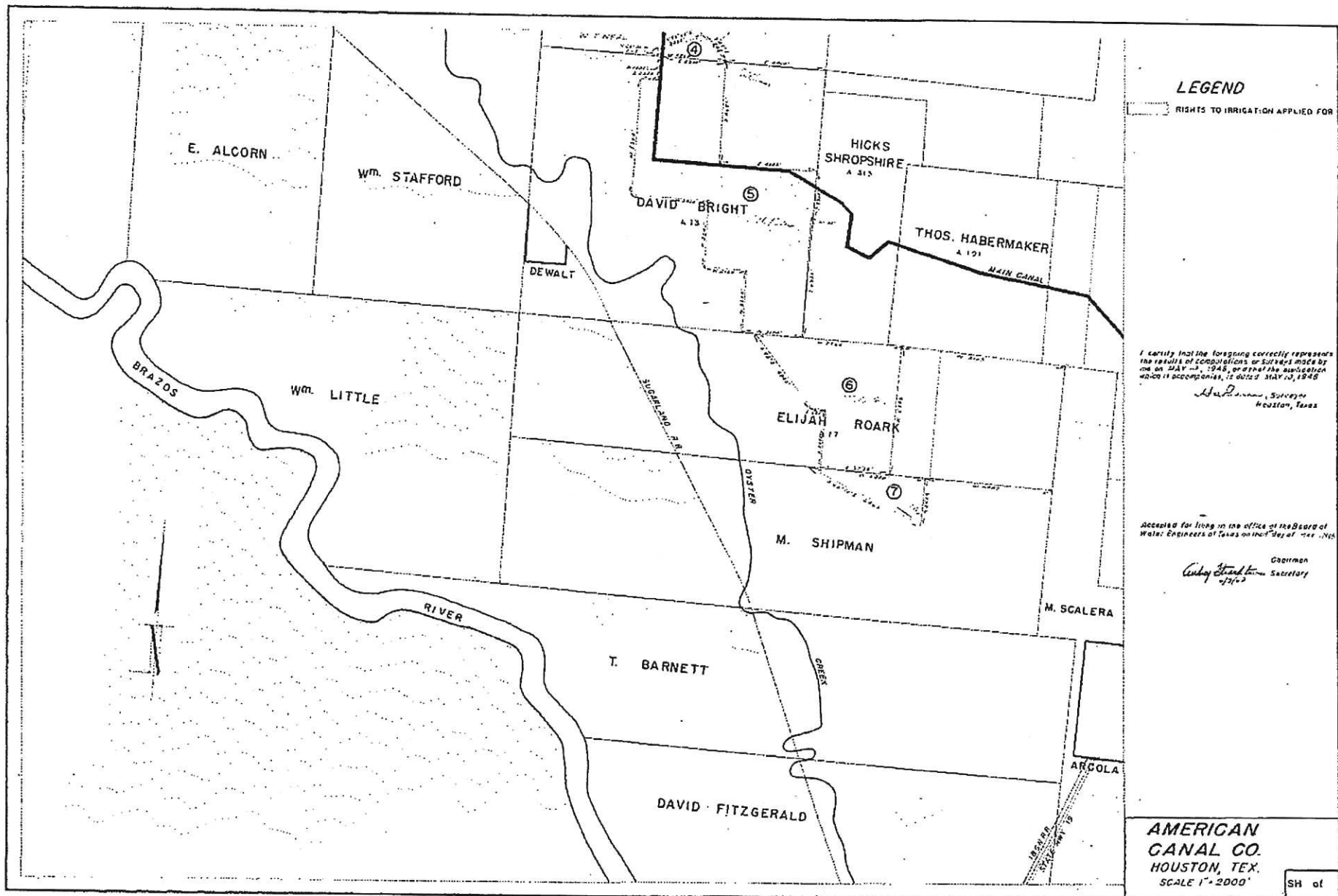






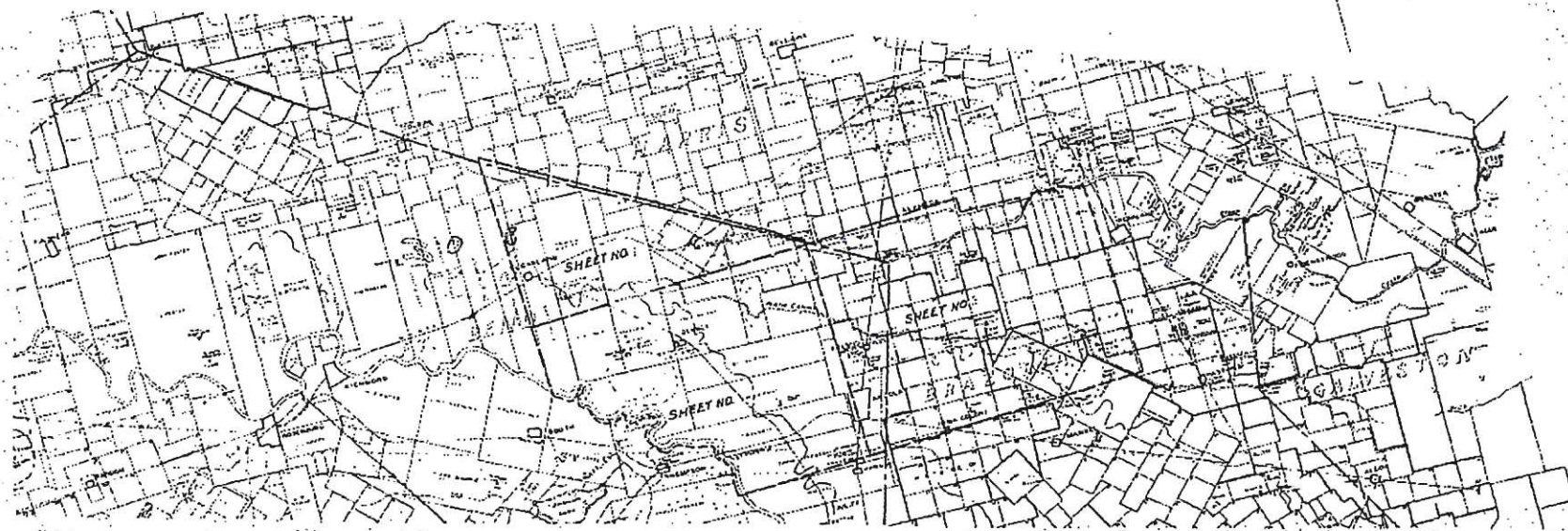






RWF 1563-34





I CERTIFY THAT THE FOREGOING CORRECTLY REPRESENTS  
THE RESULTS OF COMPUTATIONS OR SURVEYS MADE BY ME  
ON MAY 13, 1948, AND THAT THE APPLICATION WHICH  
IT ACCOMPANIES, IS DATED MAY 13, 1948.

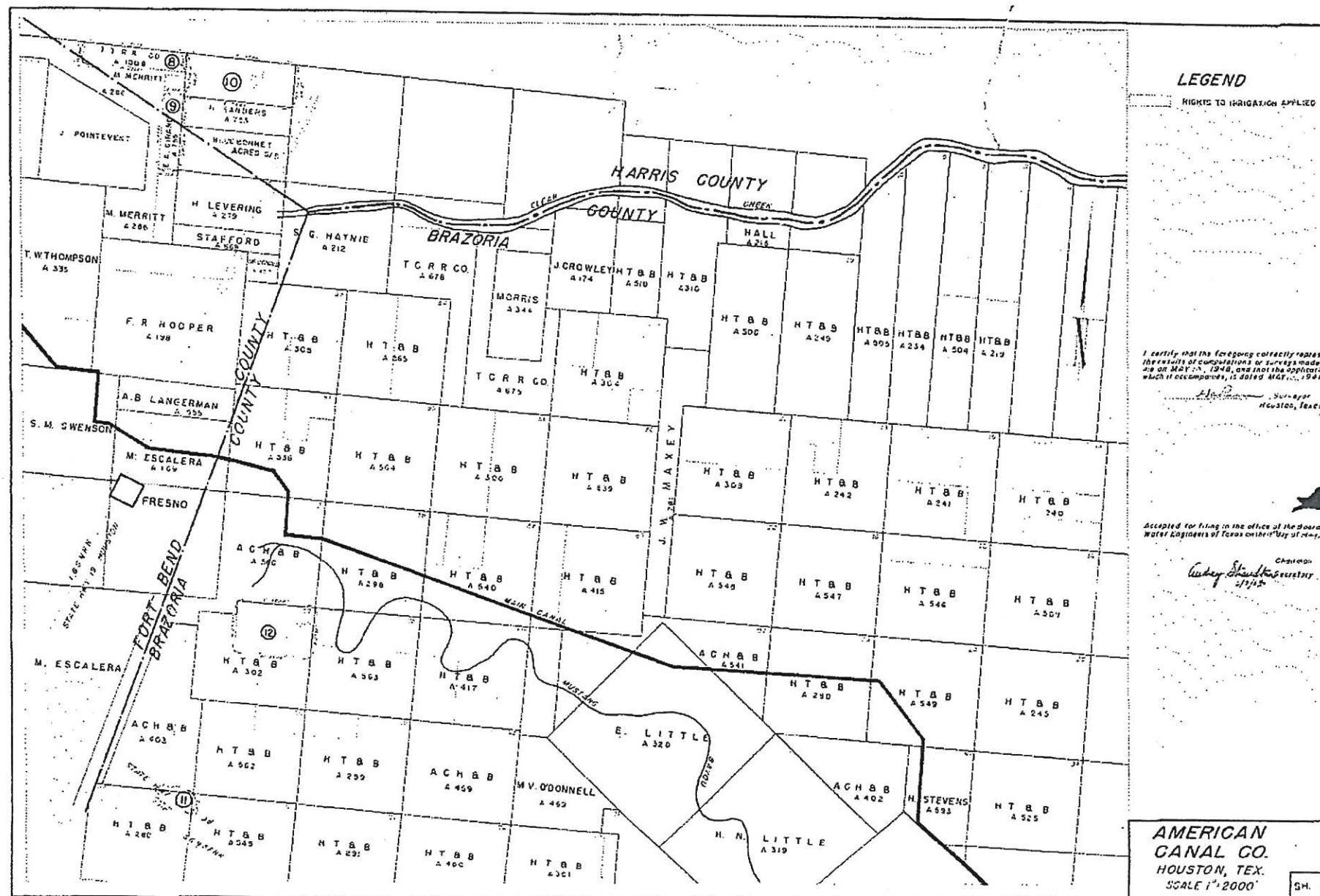
W. F. HARRIS, SURVEYOR,  
HOUSTON, TEX.

ACCEPTED FOR FILING IN THE OFFICE OF THE  
BOARD OF WATER ENGINEERS OF TEXAS ON  
MAY 13, 1948, DAY OF MAY, 1948.

J. CARLSON,  
REGISTERED ENGINEER,  
SECRETARY.

AMERICAN  
CANAL CO.  
HOUSTON TEXAS  
SCALE 1"=10000'

SH. 1 of  
Key Map



## **Appendix 6**

Worksheet 3.0 for GCWA Point #1c



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is required for each diversion point or diversion reach. Submit one Worksheet 3.0 for each diversion point and two Worksheets for each diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. GCWA Point #1c Diversion Point No.
2.                      Upstream Limit of Diversion Reach No.
3.                      Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** N/A - exit of previous discharge cfs (cubic feet per second)  
or N/A                      gpm (gallons per minute)

c. Does this point share a diversion rate with other points? Y / N / N/A  
If yes, submit Maximum **Combined Rate of Diversion** for all  
points/reaches N/A                      cfs or N/A                      gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? Y / N / N/A

**\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.**

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. Y / N / N

If yes, the drainage area is N/A                      sq. miles.

(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Oyster Creek
- b. Zip Code: 77473
- c. Location of point: In the William Stafford Grant Original Survey No. N/A, Abstract No. 89, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

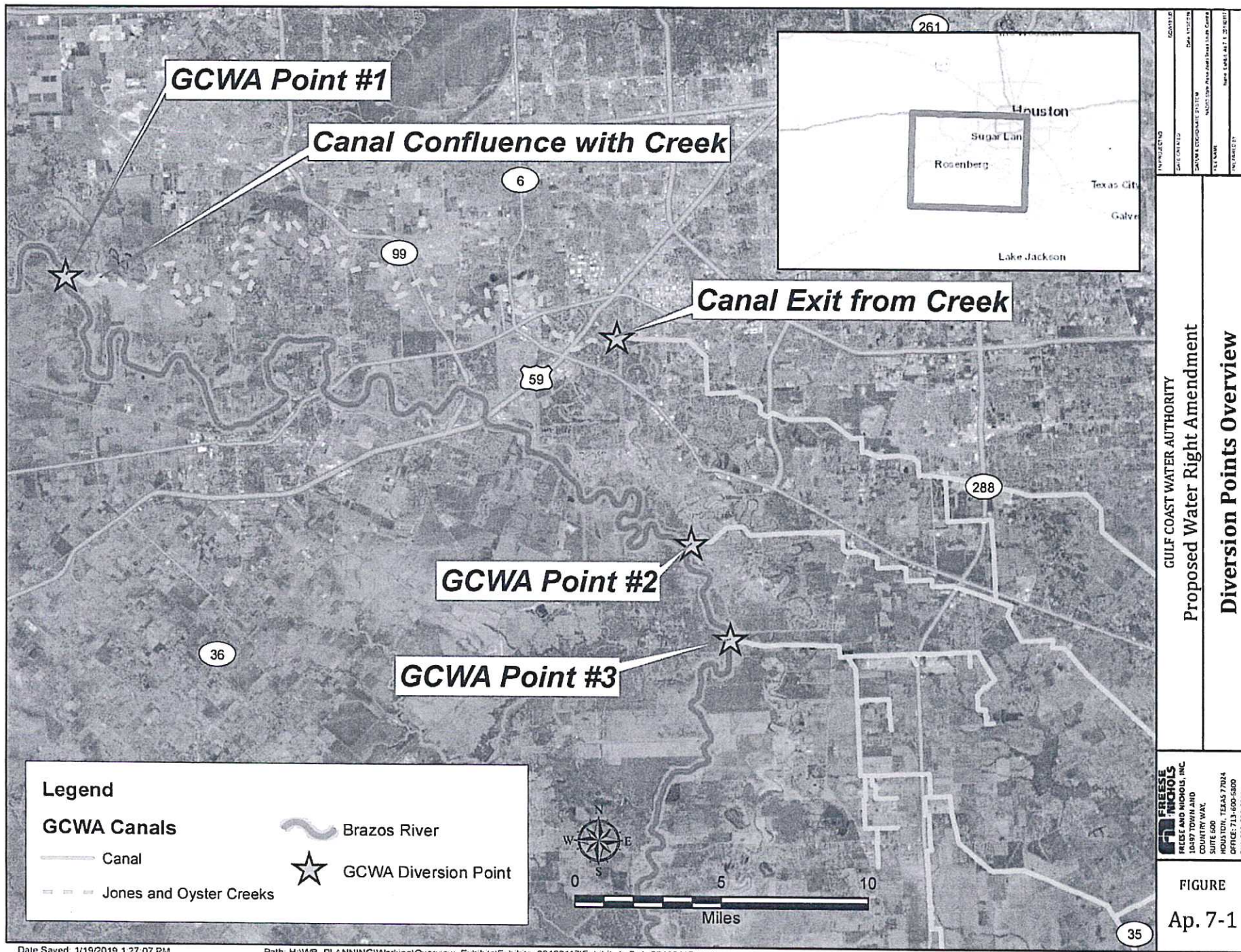
- d. Point is at:  
Latitude 29.507200°N, Longitude 95.591656°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## **Appendix 7**

Maps for GCWA Point #1c











## **Appendix 8**

### **Access Documentation for GCWA Point #1c**





1113

Vol 225 pg 516 DEED 225

516

consideration therein expressed and that she did not wish to retract it.

Given under my hand and seal of office this 14 day of February, 1945.

(L.B.)

Ina E. Lewis, Notary Public in and for,  
King County, Washington.

STATE OF ILLINOIS )

COUNTY OF COOK )

Before me, the undersigned authority, a Notary Public in and for said County and State, on this day personally appeared Edith O'Connell known to me to be the person whose name is subscribed to the foregoing instrument and who acknowledged to me that she had executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 22 day of January, 1945.

(L.B.)

D. Preston Griffin, Notary Public in and for,  
Cook County, Illinois.

\$0.55 I.R. Stamp cancelled.

Filed for record Feb. 20, 1945 at 9 o'clock A.M.

Recorded March 31, 1945 at 9:15 o'clock A.M.

C. D. Myers, County Clerk  
Fort Bend County, Texas.

*Paul Platter* Deputy

Sugarland Industries

To #47852

American Canal Company

THE STATE OF TEXAS )

COUNTY OF FT. BEND )

COMPANIES

DEED

Dated - December 14, 1943

KNOW ALL MEN BY THESE PRESENTS: That The Sugarland Industries, acting through and by its trustees, I.H. Kempner and D.W. Kempner, resident citizens of Galveston County, Texas, Walter F. Woodul, a resident citizen of Harris County, Texas, and O. D. Ulrich, a resident citizen of Fort Bend County, Texas, who act herein in their said capacities as trustees, in consideration of the sum of \$1257.00 to us in hand paid by American Canal Company, a corporation having its domicile in Houston, Harris County, Texas, the receipt whereof is hereby acknowledged, have granted, bargained, sold and conveyed, and by these presents do grant, bargain, sell and convey, but subject to the provisions hereof, and only for the purpose hereinafter stated, unto the said American Canal Company, all that certain tract of land situated in Fort Bend County, Texas, being a part of the William Stafford League and thus described:

Beginning at a point in the West right of way line of a Public Road known as "Lester Lane", said point being 923.2 feet North and N. 55 deg. 15' W. 40.3 feet of the intersection of the center lines of said Lester Lane and the Avenue Road;

Thence N. 55 deg. 15' W. 3093.4 feet to a point on the right bank of Oyster Creek, same point being at the water's edge of said Oyster Creek;

Thence S. 24 deg. 1' E. 250.4 feet to a point in said right bank of Oyster Creek, same point being at the water's edge of said Oyster Creek;

Thence S. 55 deg. 15' E. 1739 feet to a point; Thence S. 2 deg. 35' E. 177.3 feet to a point in the North bank of a lake;

Thence S. 76 deg. 50' E. 356.7 feet to a point in the said North bank of lake;

Thence N. 5 deg. 57' W. 278 feet to a point;

Thence S. 55 deg. 15' E. 976 feet to a point in the West right of way line of

Lester Lane;

Thence N. 5 deg. 35' E. 201.8 feet along the West right of way line of Lester Lane to the place of beginning and containing 16.50 acres of land, more or less, out of the Wm. Stafford League in Fort Bend County, Texas, but there is excepted herefrom and not conveyed hereby, the following described parts thereof, to-wit:

1.19 acres and 6.53 acres heretofore conveyed to the Brazos Valley Irrigation Company by deed dated January 12, 1937, recorded in Vol. 167 commencing on page 228 of the Deed Records of Fort Bend County, Texas, and also the 1/2 acre formerly known as Stafford Cemetery and later as Adams Cemetery tract, which tract is described as follows:

Begin for connection at a point in the West right of way line of a Public Road known as "Lester Lane", said point being 923.9 feet North and N. 88 deg. 15' E. 40.3 feet of the intersection of the center lines of said Lester Lane and the Avenue Road;

Thence N. 88 deg. 15' E. 3093.4 feet to a point on the right bank of Oyster Creek, same point being at the water's edge of said Oyster Creek;

Thence S. 24 deg. 1' E. 250.4 feet to a point in said right bank of Oyster Creek, same point being at the water's edge of said Oyster Creek;

Thence S. 88 deg. 15' E. 1739.0 feet to a point; Thence S. 2 deg. 35' E. 177.3 feet to a point in the North bank of a lake.

Thence S. 76 deg. 50' E. 100 feet to the place of beginning, said beginning point being in the North bank of a lake;

Thence continuing S. 76 deg. 50' E. 147.584 feet to a point for corner;

Thence N. 13 deg. 10' E. 147.584 feet to a point for corner;

Thence N. 76 deg. 50' W. 147.584 feet to a point for corner;

Thence S. 13 deg. 10' W. 147.584 feet to the place of beginning and containing 1/2 acre of land out of the William Stafford League, Fort Bend County, Texas, and being the same 1/2 acre described in a deed from A.J. Adams, et al, to H.P. Drought, dated January 5, 1916, recorded in Vol. 71, commencing on page 216, and also described in the deed from A.J. Adams, et al, to American Canal Company by deed dated April 20, 1943, and recorded in Vol. 210, page 424 of the Deed Records of Fort Bend County, Texas, the said 1/2 acre is the same excepted from the conveyance by Chas. Boedeker to The Sugarland Industries, dated Feb. 15, 1926, recorded in Deed Records of Fort Bend County, Texas, in Book 116, commencing on page 378 and is the same 1/2 acre conveyed by A.J. Adams to J.T. Stafford by deed recorded in said records in Book 1 commencing on page 8, to all of which refer, leaving conveyed hereby 8.58 acres of land, but there is excepted from said 8.58 acres of land all the minerals of every class, kind and description, including but not limited to oil, gas and sulphur, which may be on, in and under said land, together with the right of egress and ingress to and from said 8.58 acres of land for the purposes of enjoying and exercising all of said rights in and to said excepted minerals.

This deed is made subject to the terms of a certain easement made by Alcorn Land & Improvement Company to Fort Bend County Water Control and Improvement District No. One, which easement is shown by the instrument dated November 15, 1937 and recorded in the Deed Records of Fort Bend County, Texas, in Book 172, commencing on page 281, to which refer.

The only purposes for which this grant is made are that grantee, his heirs and assigns (except as otherwise therein stated) shall use said land conveyed only for an irrigation canal or canals including, but not limited to, laterals, a site for pumping plant and appurtenances thereto and upon which to erect and maintain necessary living quarters for employees or employees engaged in operating the pumping plant which may be erected thereon, and for farming; the use of said land for any other purpose shall at election of grantor, its

successors or assigns terminate this grant; in which event the right herein conveyed shall revert to grantors, its successors or assigns, upon payment by grantor to grantee, its successors or assigns, the sum of \$75.00 per acre.

Grantee agrees that neither it, its successors nor assigns will convey the right herein granted to any of said land, in whole or in part, to anyone of African descent, and that any attempt to do so shall terminate this grant and thereupon all rights conveyed shall revert to grantor, its successors or assigns.

A part of the consideration for this deed is the promise and agreement on the part of grantees, which agreement shall run with and following the title to this land, to construct and maintain sufficient drainage ditches on the lands herein described and on the outalides or North and South Boundary lines of the entire tract conveyed sufficient at all times to take care of and take away the natural drainage of the lands adjoining on each side of the land conveyed and now belonging to grantors, as well as to take care of any water which may be placed in the irrigation canal or canals now on the lands described herein as well as all of those which may hereafter be placed thereon.

TO HAVE AND TO HOLD the above conveyed premises, but subject to said exceptions, together with all and singular the rights and appurtenances thereto in anywise belonging, except those excepted herefrom, unto the said American Canal Company, its successors and assigns forever, and grantor, but not the signers hereto personally, does hereby bind itself and its successors to warrant and forever defend all and singular the said conveyed premises unto the said American Canal Company, its successors and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof.

EXECUTED on this the 14th day of December, 1943.

THE SUGARLAND INDUSTRIES

By I.H. Kempner

D.W. Kempner

G.D. Ulrich

Walter F. Woodul

As Trustees Aforesaid

\$1.65 I.R. Stamp cancelled.

(L.S.)

ATTEST:

Thos. L. James  
Secretary.

THE STATE OF TEXAS )

COUNTY OF FT. BEND )

BEFORE ME, the undersigned authority, in and for Fort Bend County, Texas, on this day personally appeared G.D. Ulrich, known to me to be the person whose name is subscribed to the foregoing instrument as a trustee of The Sugarland Industries, and he acknowledged to me that he executed the same for the purposes and for the consideration therein expressed and in the capacity stated.

GIVEN UNDER MY HAND and seal of office, this 21st day of December, 1943.

(L.S.)

J.E. Loring Notary Public in and for,  
Fort Bend County, Texas.

THE STATE OF TEXAS )

COUNTY OF GALVESTON )

BEFORE ME, the undersigned authority, in and for Galveston County, Texas, on this day personally appeared I.H. Kempner and D.W. Kempner, known to me to be the persons whose names are subscribed to the foregoing instrument as trustees of The Sugarland Industries, and they acknowledged to me that they executed the same for the purposes and for the consideration therein expressed and in the capacities stated.

GIVEN UNDER MY HAND AND SEAL of office, this 20 day of December, 1943.

(L.S.)

## **Appendix 9**

### **Canal System Conveyance Loss Study**



**Gulf Coast Water Authority**  
**Water Audit and Water Use Projections**

**Phase 1 Study Report**

**February 1999**

**Freese & Nichols, Inc.**

**Brown & Root Services**

**Gulf Coast Water Authority**  
**Water Audit and Water Use Projections**

**Phase 1 Study Report**

**February 1999**

*This document was prepared by Brown & Root Services under contract with Freese and Nichols Inc.*



*David L. Parkhill* 2/16/99

David L. Parkhill, P.E.  
Brown & Root Services

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The Gulf Coast Water Authority (GCWA) owns and operates a canal system which pumps water from the Brazos River and Oyster Creek in Fort Bend County and delivers that water to irrigators, industries and municipalities in Fort Bend, Brazoria and Galveston Counties. The GCWA is permitted to pump an average of 200.77 million gallons per day (MGD) from the Brazos River, and divert an average 10.71 MGD from Oyster Creek. The GCWA also holds contracts to pump an additional 29.16 MGD (average) from the Brazos River, for a total average rate of 240.64 MGD. The maximum permitted diversion rate is 1,345 cubic feet per second, or 869 MGD.

This study was commissioned to determine the capacity of the canal system, to develop estimates of unaccounted water gains and losses in the raw water delivery system, and to make recommendations for system improvements.

#### CANAL SYSTEM

The GCWA canal system is made up of:

- System A: Shannon Pump Station (4 pumps-250,000 gpm capacity)  
Jones Creek (18.5 miles)  
Oyster Creek (14.75 miles)  
8 small lakes (8,925.48 acre-feet capacity)  
Second Lift Pump Station (4 pumps - 156,000 gpm capacity)  
American Canal (32.3 miles)  
Lateral 10 (6.5 miles)
- System B: Briscoe Pump Station (3 pumps - 210,000 gpm capacity)  
Briscoe Canal (35 miles)  
Monsanto Canal (5.5 miles)  
Ranch Canal (10.67 miles)
- GCWA System: Galveston Canal (17.4 miles)  
Industrial Reservoir (7,308 acre-feet capacity)  
Discharge Canal (4.5 miles)

An overall map of system features is included as Figure 1-1.



WATER AUDIT

A water audit was conducted for 1996 and 1997 based upon available records. Estimated pumped diversions were compared with customer deliveries to determine a gross balance. The source and magnitude of individual gains or losses were then estimated to obtain an overall balance. System gains include rainfall and collected runoff. System losses include evaporation, seepage, dam overflows, and changes in reservoir storage. In both years, the calculated diversions and gains exceeded the system deliveries and losses, indicating that one or more estimated parameter is incorrect.

Pumped diversions were calculated using daily records of pump run times and inlet conditions. GCWA pumping rates were verified using available pump curves and energy-use records.

Runoff collected in Jones Creek was calculated empirically using available data. A precipitation-to-collected-runoff relationship could not be determined for Oyster Creek or the isolated canal sections that receive runoff. Collected runoff for these segments was estimated using rainfall records and assumed rates.

Regional evaporation, as calculated by the Texas Water Development Board, was 48.61 inches in 1996. Evaporation data was not available for 1997, so the historic average of 47.81 inches was assumed.

Regional rainfall records were available from the Texas Water Development Board for 1996 and from local collection stations for 1997. These amounts, 46.41 inches and 73.16 inches, respectively, were combined with the evaporation rates to provide a net evaporation gain or loss.

Seepage was calculated from available data for Jones Creek and the Soils Surveys for Galveston, Fort Bend and Brazoria Counties. Jones Creek loses an average 5.29 feet per year to seepage. This rate was applied to Jones and Oyster Creeks (both natural channels). The soils under the Reservoir allow up to 51.1 acre-feet per year to escape through groundwater seepage. This is less than one inch per year in surface elevation, and was confirmed by observations made during

a period of canal maintenance in July 1998. Similarly, the soils under the canals allow up to 9009.6 acre-feet per year to escape. System-wide losses of approximately 12,600 acre-feet of water per year were estimated.

Change in reservoir storage was calculated using surface elevation records for the Industrial Reservoir and the series of eight reservoirs along Oyster Creek. All canal water levels were assumed to be equal at the start and end of each period.

Spills occur on Jones Creek, where water is dammed to allow gravity flow into Oyster Creek, and on Oyster Creek, where water is dammed to ensure a constant inlet depth for the Second Lift Pump Station. The dam on Jones Creek is a fixed spillway, and spills were calculated using daily depth records. The dam on Oyster Creek has automated gates that are controlled by a level sensor. Available records are insufficient to estimate spills for this dam.

The audit for 1996 indicates 144,400 acre-feet of water was diverted from the Brazos River, and 120,400 acre-feet was delivered to customers; a difference of 24,000 acre-feet or 20 percent of the total amount delivered. After estimating individual system gains and losses, including 3,400 acre-feet of runoff taken under permit 1467, a net loss of 14,500 acre-feet was estimated, or 12 percent of the total amount delivered. Likely sources of this discrepancy are (1) inaccurate runoff and spill estimates, (2) high pumping estimates, and/or (3) inaccurate irrigation estimates. Installation of flow meters at the pump stations will document the pumping rates and eliminate this uncertainty. Additional data must be collected to accurately calculate runoff and spills throughout the system.

The audit for 1997 indicates 117,600 acre-feet of water was diverted from the Brazos River, and 120,300 acre-feet was delivered to customers; a difference of 2700 acre-feet or 2 percent of the total amount delivered. After estimating individual system gains and losses, including 9,800 acre-feet of runoff taken under permit 1467, a net loss of 1,800 acre-feet was estimated, or 1.5 percent of the total amount delivered. The same sources of the discrepancy discussed for 1996 are likely. The decrease in unaccounted losses between the two years corresponds to an increase

in rainfall, indicating that the greatest error is in estimation of irrigation diversions, runoff, spills and net evaporation.

#### SYSTEM CAPACITY

The clean, unsilted capacity of the canal system was determined using mathematical models of hydraulic conditions in the canal system for two conditions: 1) Flow to the top of the levee at the greatest restriction, and 2) Flow to provide one foot of free board to the top of the levee at the greatest restriction.

Available records show the pumps at the Shannon and Briscoe Pump Stations operate at or near their rated capacities. The GCWA recently rebuilt several pumps and provides excellent equipment maintenance. The pumps at the Second Lift Pump Station operate above their rated capacity, but at reduced efficiency. This is due to the installation of a check dam on Oyster Creek that maintains a constant inlet elevation, which is greater than the original inlet elevation.

With clean, unsilted channels, the system can deliver up to 490 cubic feet per second (cfs), or 317 MGD, from the Brazos River to the Industrial Reservoir. This is significantly above the 240.6 MGD the GCWA may divert under current permits and contracts, yet is significantly less than the maximum permitted diversion rate of 869 MGD. The clean, unsilted capacity is approximately three times the peak daily demand from the Reservoir. The hydraulic capacity is generally limited by the size of in-line siphons and not by levee height. The greatest single restriction is located on the Galveston Canal above the junction with the Briscoe Canal (Check 3), where an in-line siphon reduces flow through a single 48 inch gate valve. This restriction reduces canal capacity from a potential 430 cfs to 195 cfs.

The system capacity was also estimated assuming one foot of silt in the entire canal system. With silted channels, the system can still deliver 440 cfs, or 284 MGD. The limiting restriction under this condition is still the in-line siphon at Check 3 on the GCWA Canal.



RECOMMENDATIONS

It is recommended that the GCWA install flow meters or other measuring devices throughout the system to improve record keeping and billing. Due to the amount of silt and debris carried by the pumped water, Parshall flumes with automatic level meters are recommended for pump station flow monitoring. Elsewhere in the system, flow meters are recommended for installation at key restrictions and branch canals. Ideally, flow to all customers should be metered, but this may be impractical for the numerous irrigation take-offs. Metering flow at key junctions and branch canals would facilitate more accurate irrigation billing and help identify segments with unaccounted losses.

It is also recommended that the siphon at Check 3 on the Galveston Canal be replaced with a 72 inch pipe. This will double the capacity of that section from 195 cfs to 390 cfs, and increase the system capacity from the current 490 cfs (317 MGD) to 510 cfs (330 MGD).

To optimize energy efficiency within the system, it is recommended that the vertical pumps (3 and 4) be used at the Second Lift Pump Station. These pumps operate at a greater efficiency under the current conditions than do the centrifugal pumps. It is further recommended that the impellers of all of these pumps be trimmed and/or the speed changed to improve their efficiency. Also, under current conditions, energy savings can be realized by adjusting water diversions based upon Brazos River stage. The river stage varies more at the Briscoe Pump Station than at Shannon, therefore the energy cost per gallon fluctuates over a greater range. A graph was developed to show which System is more cost effective to use based on the stage of the Brazos River.

It is recommended that the entire canal system be surveyed. All calculations included in this study are based upon canal dimension and elevation records provided by the GCWA. To accurately model the system, surveyed cross sections are required for every bridge, siphon and curve, and at selected intermediate points. The GCWA canal system would require approximately 2,000 cross sections, at an estimated total cost of \$300,000. This survey data will allow accurate assessment of any future changes, including new customers, increased customer

demand, and system modifications, as well as identify the locations where siltation has most affected the capacity. It would be possible to prioritize and sequence this work to incrementally provide the most needed information first and minimize the effect on cash flow. In addition, the Texas Water Development Board has a hydrographic survey program which could measure the siltation effects in the Reservoir for as little as \$10,000.

Finally, current seepage rates are based upon averaged soil conditions and the peak permeability. To better estimate seepage, it is recommended that the GCWA record the canal level during periods when segments are closed for maintenance. If data can be collected for an extended period, the average seepage rate can be calculated.

This study was performed by Freese & Nichols and Brown & Root for the Gulf Coast Water Authority (GCWA) to audit the capacity and gains/losses in GCWA's canal system and project future water usage. This section discusses the history of the GCWA canal system, and describes the purpose and scope of work for the study.

## **1.1    BACKGROUND**

The GCWA Canal System consists of two systems, A and B. The following paragraphs provide a description and history of each.

### **1.1.1.    System A**

System A runs north of and parallel to Highway 6 from the Shannon Pump Station on the Brazos River, 12 miles north of Rosenberg near Fulshear, to Texas City (Figure 1-1). The Shannon Pump Station discharges into a 1.25 mile-long, man-made canal that empties into Jones Creek, the normal flow from which is diverted into Oyster Creek at Skinner Road. A dam on Oyster Creek near Lexington Drive in Missouri City maintains inlet depth for the Second Lift Pump Station, which discharges into the American Canal system that flows to Texas City. Information on the Shannon and Second Lift Pump Stations is provided in Table 1-1.

The American Canal is 32.3 miles in length. It serves two metered customers, has 22 check dams and 25 irrigation take-offs. Water passes through 13 siphons or restrictions between the Second Lift Pump Station and the end of the system.

### *History*

The history of Canal System A dates back to the year 1908 with the establishment of the Cane and Rice Belt Irrigation Company and the construction of a pump station on the Brazos River south of Fulshear, Texas, and a relift station along Jones Creek. These provided water to sugar cane and rice fields from the Brazos River to Sugarland, Texas, and to the north beyond what is now Westheimer Road (Unit 1).



Table 1-1  
System A Pump Station Equipment

Pump	Motor/Pump Type	Motor/Pump Manufacturer	Horsepower	Rated Capacity (gpm)
Shannon Pump Station				
#1	Electric/ Centrifugal	Westinghouse/ Dayton-Dowd	450	50,000
#2	Electric/ Centrifugal	Westinghouse/ Dayton-Dowd	450	50,000
#3	Electric/ Centrifugal	Westinghouse/ Worthington	450	50,000
#5	Natural Gas/ Vertical	Worthington/ Johnson	1000	100,000
Second Lift Pump Station				
#1	Electric/ Centrifugal	General Electric/ Dayton-Dowd	500	42,000
#2	Electric/ Centrifugal	Westinghouse/ Dayton-Dowd	350	42,000
#3	Electric/ Vertical	General Electric/ Louisiana	350	40,000
#4	Gasoline/ Vertical	Ingersoll Rand/ Louisiana	275	32,000

The Canal System was expanded in 1931 when the relift station was moved from its original location along Jones Creek and the headwaters of Oyster Creek to the Sugarland area. This provided for the transportation of water to eastern Fort Bend County, on into Brazoria County north of Highway 6, and south of Clear Creek eastward into the Alvin area (Unit 2). At that time the River Plant and the relift station were converted from steam power to electric power. Of note, Unit 2 and all subsequent canals are man-made while Unit 1 maintains operations within the natural stream beds of Jones and Oyster Creeks.

Further development of the Canal System continued in the early 1940's with the "New Extension" which linked the system to Galveston County. The Canal System has been known as the Cane and Rice Belt Irrigation Company, the Brazos Valley Irrigation Company and the American Canal Company, a division of the American Rice Growers Association. In 1958 the American Canal Company was purchased by a partnership of six individuals who changed the name to American Canal Company of Texas.

As discussed in Section 1.1.3, the American Canal Company of Texas was purchased by the Brazos River Authority in 1967.

**1.1.2. System B**

System B runs south of and parallel to Highway 6 from the Briscoe Pump Station on the Brazos River six miles west of Arcola, Texas, to the Monsanto and Ranch Canals south of Alvin, Texas. It then joins the Galveston Canal, which begins near the end of System A and terminates at the Industrial Reservoir in Texas City (Figure 1-1). Information on the Briscoe Pump Station is provided in Table 1-2.

The Briscoe Canal is 35 miles in length and has two branch canals adding 16.5 miles. It serves four metered customers and has 11 check dams and 60 irrigation take-offs. Water passes through 12 siphons or restrictions between the pump station and the Galveston System. Additionally, there are seven siphons or restrictions in the Ranch Canal.

**Table 1-2**  
**System B Pump Station Equipment**

<b>Pump</b>	<b>Motor/Pump Type</b>	<b>Motor/Pump Manufacturer</b>	<b>Horsepower</b>	<b>Rated Capacity (gpm)</b>
<b>Briscoe Pump Station</b>				
<b>#1</b>	Electric/ Centrifugal	Electric Machinery/ Dayton-Dowd	1000	70,000
<b>#2</b>	Electric/ Centrifugal	Electric Machinery/ Dayton-Dowd	1000	70,000
<b>#3</b>	Electric/ Centrifugal	Electric Machinery/ Dayton-Dowd	1000	70,000

*History*

The Briscoe Irrigation System was built in 1940 and delivered its first water for rice irrigation in 1941. The original system ran from the Brazos River to Alvin and down to Galveston Bay. Briscoe's growth came in the mid-1940's when it contracted with such industries as the Industrial Water Company in Texas City and Monsanto Company, located on the banks of Chocolate Bayou, to build canals directly to industrial sites. The American Canal Company of Texas also obtained industrial contracts in the mid-1960's when the demand for water in Texas City

exceeded the supply Briscoe Irrigation could provide. The American Canal Company of Texas was contracted to supply an additional 22 million gallons of water per day, adding to the 50,625 million gallons of water per day that Briscoe supplied to the industries at that time.

**1.1.3. Ownership**

In March 1967 the Brazos River Authority (BRA) purchased all of the assets of the American Canal Company of Texas and in the latter part of that same year purchased the Briscoe Irrigation Company, creating the Canal Division. The canals then became known as System A (American), running north of and parallel to State Highway 6, and System B (Briscoe), running south of and parallel to Highway 6.

In 1971 the BRA purchased the Galveston System from the Industrial Water Company. The Galveston System is that part of the canal that extends from the old Briscoe System to the GCWA Reservoir, and that part which connects the old American System to the Galveston System at a point known as Site 17 which was completed in the mid-1960's. This canal is 17.5 miles in length, has 6 check dams and 14 irrigation take-offs. Water passes through 19 siphons or other restrictions between the American Canal and the Industrial Reservoir.

In 1975 a lateral connection was made from System A to System B, known as Lateral 10. This provided a waterway to supply raw water to a new industrial customer, the Chocolate Bayou Company. This lateral runs from north to south and is located just west of Manvel, Texas. It is 6.5 miles in length, has seven irrigation take-offs and contains seven siphons or restrictions.

In July 1988, Galveston County Water Authority purchased the Canal Division of the BRA, thereby gaining perpetual water rights to the waters of the Brazos River and the ability to furnish water to customers in a three county area (Fort Bend, Brazoria and Galveston). The Galveston County Water Authority was renamed the Gulf Coast Water Authority in 1991 to reflect the expanded service area.



**1.1.4. Water Rights**

Table 1-3 summarizes the water rights held by the GCWA and the following paragraphs provide a brief description of each.

**Table 1-3**  
**Summary of GCWA Water Rights**

CA # (Permit #)	Total		Max Rate		Source	Uses
	(ac-ft/year)	(MGD)	(cfs)	(MGD)		
5168 (1040I)	99,932	89.20	685.00	442.74	Brazos River	Municipal, Industrial and Irrigation
5169 (1467D)	12,000	10.71	60.10	38.84	Oyster Creek	Municipal, Industrial and Irrigation
5171 (1299D)	125,000	111.57	600.00	387.80	Brazos River	Irrigation (up to 50,000) Municipal, Industrial and Mining
(137, BRA)	23,333	20.83			Brazos Reservoirs	Contracted for Municipal and Industrial
(137, BRA)	9,335	8.33			Brazos Reservoirs	Contracted for Municipal and Industrial
<b>Total:</b>	<b>269,600</b>	<b>240.64</b>	<b>1,345.10</b>	<b>869.38</b>		

Note: CA = Certificate of Adjudication

The GCWA diverts "run of river" water from the Brazos River under Texas Water Commission Permits 1040 and 1299. These permits allow diversions of up to 224,932 acre-feet per year, or 200.77 million gallons per day (MGD), from the Brazos at the Shannon and Briscoe Pump Stations. Additionally, 12,000 acre-feet per year, or 10.71 MGD, may be diverted from Oyster Creek under Permit 1467. During periods of peak demand, a maximum diversion rate of 830.54 MGD is allowed from the Brazos, and 38.84 MGD is allowed from Oyster Creek. This water is used for a combination of municipal, industrial and irrigation customers.

The GCWA also holds contracts for water impounded by the BRA. This water is purchased from the BRA under two separate contracts, one for 23,333 acre-feet per year (20.83 MGD) and one for 9,335 acre-feet per year (8.33 MGD). The GCWA must request release of this water from upstream reservoirs through the BRA. Once released, the GCWA diverts the water from the Brazos. These reservoir releases are normally used only in times of reduced flow in the Brazos.

Finally, GCWA is authorized under Permit 1040 to impound 7,308 acre-feet of water in the Industrial Reservoir located in Texas City. It is also allowed, under Permit 1467, to impound 8,925.48 acre-feet of water in a series of reservoirs (man-made lakes) located along Oyster Creek.

## **1.2 PURPOSE AND SCOPE OF STUDY**

The purpose of this study is to estimate the hydraulic capacity of the GCWA canal system, to make recommendations for system improvements, and to develop estimates of unaccounted water losses in the GCWA raw water delivery system.

This study includes the following:

- a. Obtain flow data in GCWA canals, from the Brazos River to the Industrial Reservoir, and from the reservoir to the Industrial Pump Station.
- b. Obtain and review existing data on GCWA raw water conveyance facilities.
- c. Obtain and review information on existing gains and /or losses in the system.
- d. Obtain and review elevation and capacity data for the Industrial Reservoir.
- e. Obtain copies of water rights and contracts for water supply.
- f. Obtain information on projected water needs of existing and potential municipal and industrial customers.
- g. Accompany the GCWA staff on a tour of the pumping and raw water delivery system.
- h. Discuss historic operations with the GCWA staff.
- i. Compare metered pumping at GCWA pump stations with previous estimates of pumping.
- j. Obtain data on soils, evaporation and rainfall and estimate losses from seepage and evaporation, and gains from precipitation and runoff.

- k. Based on available data, develop estimates of unaccounted water losses in the GCWA raw water delivery system. Prepare a memorandum report describing the water audit, listing possible sources of unaccounted water losses, and giving recommendations for system improvements.
- l. Meet with GCWA staff to review the memorandum report. Incorporate comments, as appropriate, and finalize the report.

### 1.3 CONTENTS OF REPORT

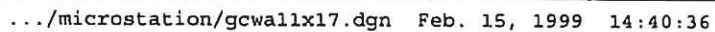
The following presents a brief overview of the remaining sections of this report.

Section 2, Water Balance, provides a summary of the process used and results of estimates of the system gains and losses.

Section 3, System Capacity, provides a summary of the system pumping and water carrying capacities.

Section 4, Recommendations, provides a discussion of potential modifications that could be made to improve system operation.





The GCWA pumps water from the Brazos River at two points and delivers that water in open canals to industrial and irrigation customers within Fort Bend, Brazoria and Galveston Counties. The canal system terminates at the Industrial Reservoir in Texas City. From there, the water is transferred via another canal to the Water Treatment Plant or the Industrial Pump Station, and delivered to customers by pipe. This water audit addresses the canal and reservoir system only.

The canal system is divided into three components (see Figure 1-1). System A consists of the Shannon Pump Station on the Brazos River above Sugar Land, Jones Creek, Oyster Creek, the Second Lift Pump Station in Missouri City and the American Canal. System B consists of the Briscoe Pump Station on the Brazos River below Missouri City and the Briscoe Canal. The Galveston System consists of the GCWA Canal connecting the American and Briscoe Canals to the Industrial Reservoir, the reservoir itself, and the canal connecting the Reservoir to the Water Treatment Plant and Pump Station.

This audit or water balance is based upon daily system operating records for 1996 and 1997, canal and pump data provided by the GCWA, and other regional and historic data as available. Empirical data was used to the greatest extent possible. Any assumptions used are addressed in their respective sections. As evidenced by the rainfall at Shannon (30.2 inches) compared to the annual average (47.8 inches), 1996 is considered a dry year, and 1997 is considered a wet year, with the rainfall at Shannon (62.3 inches) greatly exceeding the annual average.

## **2.1 PUMPED DIVERSIONS**

A total of seven pumps (four at Shannon and three at Briscoe) are available to divert water from the Brazos River into the GCWA canal system, and four additional pumps are available at the Second Lift to lift the water from Oyster Creek into the American Canal. The daily flows from these pumps are calculated using a Parshall flume at the Shannon Plant and historical data at the other pump stations. Flow meters are currently being installed at all pump stations. Because pumps run at fixed speed, pumping rates could be estimated for typical operating conditions. Pumped diversions were calculated using estimated pumping rates and recorded pump run times.

The methods used to determine pumping rates are addressed in Section 3, Capacity. Daily pumping hours and rates are tabulated in Appendix C.

In 1996, the Shannon Pump Station diverted 55,000 acre-feet of water from the Brazos River into Jones Creek. The Briscoe Pump Station diverted 89,400 acre-feet from the Brazos, for a total of 144,400. The Second Lift Pump Station transferred 54,000 acre-feet of water internally from Oyster Creek to the American Canal.

In 1997, the Shannon Pump Station diverted 24,000 acre-feet of water from the Brazos River into Jones Creek. The Briscoe Pump Station diverted 93,600 acre-feet from the Brazos, for a total of 117,600. The Second Lift Pump Station transferred 31,300 acre-feet of water internally from Oyster Creek to the American Canal.

## 2.2 DELIVERED WATER

Meter records and TNRCC reports from 1996 and 1997 were used to determine water deliveries during those years. Customers were identified within each canal segment and total withdrawals within each segment were accounted for. As expected, irrigation use varied widely between dry (1996) and wet (1997) years, yet this did not reflect in the total use reported. Total deliveries for 1996 were approximately 120,400 acre-feet, and for 1997 were 120,300 acre-feet. (Table 2-1). Tables detailing customer deliveries are provided in Appendix D.

**Table 2-1**  
**Summary of Customer Deliveries**

Use	Contract		1996		1997	
	Annual Average (MGD)	Annual Total (acre-feet/year)	Annual Average (MGD)	Annual Total (acre-feet/year)	Annual Average (MGD)	Annual Total (acre-feet/year)
Industry (canal diversions)	28.7	32,143.9	14.0	15,725.5	23.4	26,265.2
Irrigation *	1.1	1,193.2	25.3	28,355.2	9.8	10,972.9
Water Plant	18.0	20,166.3	12.7	15,464.0	12.8	16,083.1
TexasCity Industry	62.4	69,925.4	54.3	60,853.7	59.8	67,022.5
Totals:	110.2	123,428.7	145.7	120,398.4	139.1	120,343.7

\* Irrigation includes golf courses and agricultural use. There are only contracts for golf courses.



**2.3    ESTIMATED GAINS AND LOSSES**

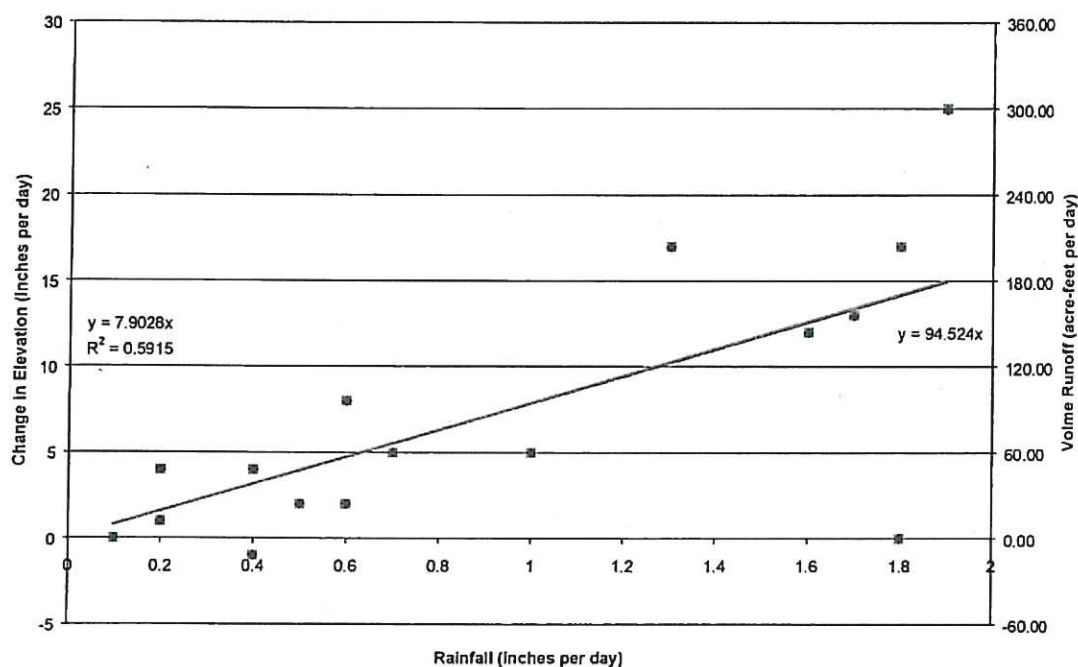
In 1996, the total estimated amount of water pumped from the Brazos River was 144,400 acre-feet. Of that, 120,400 acre-feet was reported as delivered to customers, resulting in an overall loss of 24,000 acre-feet (20 percent of the total amount delivered). Similarly, approximately 117,600 acre-feet of water was diverted from the Brazos in 1997, and 120,300 acre-feet was reported as delivered, resulting in an overall gain of 2,700 acre-feet (2 percent of the total amount delivered). Gains to the system could potentially come from direct rainfall onto the canals, Reservoir, and lakes, and from runoff collected in the various drainage basins. Water is potentially lost to changes in storage in the Industrial Reservoir and lakes along the canal system, evaporation, seepage, and overflows.

**2.3.1.   Rainfall/Runoff**

Rainfall contributes flow to the canal system in two ways. First, rainfall on the canal itself directly adds flow to the system. These inflows are accounted for in the net evaporation rate (Section 2.3.3). Second, rainfall over adjoining drainage basins results in runoff into the system. Because the canals and reservoir are elevated (contained by levees), runoff is primarily collected in only Jones and Oyster Creeks. In addition, the upper two miles of the West Fork of Chocolate Bayou contributes runoff to the Briscoe Canal above Lateral 10. Two other locations on the American and Briscoe Canals receive runoff in lesser amounts.

Runoff contributions to Jones Creek were calculated empirically by reviewing records from 1997 and identifying days when there was rainfall, no pumping at the Shannon Pump Station, no spills at Dam 1 and no flow into Oyster Creek. By plotting (Figure 2-1) the change in water level in Jones Creek vs. the daily amount of rainfall recorded at the Shannon Pump Station, a relationship of 7.9 inches of rise per inch of rain was determined. Note that the correlation coefficient ( $R^2$ ) for this relationship is only 0.59 (a value of 1 indicates a perfect relationship). Therefore, and as indicated on the graph, this relationship is only approximate. The annual volume of collected runoff was then calculated as total rainfall recorded at Shannon Pump Station times 7.9 inches times the surface area of Jones Creek. This method produced estimates of 2800 acre-feet of collected runoff for 1996, and 5900 acre-feet for 1997.

Figure 2-1  
Runoff versus Rainfall in Jones Creek



Data was not available to calculate runoff for Oyster Creek or Chocolate Bayou. For these streams, the rational method was used. In this method, total rainfall is multiplied by a runoff coefficient and the drainage area to obtain a runoff volume. All rainfall was assumed to produce runoff and a 15 percent runoff factor was used (i.e., 15 percent of the rainfall results in runoff). This method produced collected runoff estimates for Oyster Creek of 8,100 acre-feet in 1996 and 16,700 acre-feet in 1997. Although significantly larger than the figures for Jones Creek, these estimates are coupled with correspondingly large dam overflow estimates (Section 2.3.5), which offset any significant errors. For Chocolate Bayou, the estimated runoff collected was 900 acre-feet in 1996, and 2,600 acre-feet in 1997.

No data was available to calculate runoff collected in the two locations along the American and Briscoe Canals. Using available maps, the drainage basins were estimated to be less than 250 acres each. This size fell within the possible error in calculating Chocolate Bayou inflows, and was therefore ignored.

#### 2.3.2. Changes in Storage

Changes in level from January 1 to December 31 were used to estimate the change in storage for use in the water balance. Canals were assumed to have no net storage (i.e., they start and end each year at the same depth) for two reasons. First, there was no available data regarding the change in elevation from year to year, and, second, the changes in canal level result in relatively small changes in storage (only 940 acre-feet per foot of change in depth).

Reservoir storage was accounted for as the change in depth multiplied by the surface area. The recorded depth at Dam 2 was used in conjunction with surface area to calculate changes in storage in Oyster Creek Lake, Cleveland Lake, Hall Lake, Brooks Lake and Char Lake. Similarly, the recorded depth at Dam 3 was used to calculate storage in Eldridge Lake, Alkire Lake and Horseshoe Lake. Using this method, the estimated change in storage was an increase of 740 acre-feet in 1996, and 340 acre-feet in 1997.

#### 2.3.3. Evaporation

In 1996, the gross evaporation rate recorded by the Texas Water Development Board for the region was 48.61 inches, and the precipitation for the year was 46.41 inches. The net evaporation rate (evaporative losses minus rainfall gains) is therefore 2.2 inches, or 0.18 feet per year. Evaporation and rainfall data for 1997 were not available, so the historic average evaporation of 45.93 inches was assumed. Precipitation measured at local stations (Arcola, Santa Fe, and Texas City) averaged 73.16 inches that year, for a net gain of 27.23 inches, or 2.27 feet per year. These approaches produced a net evaporative loss from the GCWA system of 400 acre-feet in 1996 and a net gain of 5,000 acre-feet in 1997.



2.3.4. Seepage

A review of the soil surveys for Fort Bend, Brazoria and Galveston Counties indicates that soils are fairly uniform throughout the canal system. Two major soil types are prevalent; alluvial deposited silty-clays along the Brazos River and Beaumont-type loams and clays throughout the balance of the region. A review of the geologic atlas also indicates similar substrates. Documented permeability rates for these soils range from 0 to 2 inches per hour (See Appendix B).

For the alluvial region along the Brazos River, the seepage rate was calculated by reviewing daily records of water level in Jones Creek during a period with no pumping at the Shannon Pump Station and no reported overflows. From January 15, 1996 to February 14, 1996, the recorded water level in Jones Creek fell 7 inches. During that period, 0.4 inches of rain was recorded, for a net loss of 7.4 inches (assuming there was no runoff since the rainfall amount, which occurred on one day, did not exceed 0.5 inches). The regional evaporation for January 1996 was 2.11 inches, leaving 5.29 inches of loss for the one-month period due to seepage. This rate equals 0.0072 inch per hour, which is within the expected range. This value was used to estimate seepage losses along Jones and Oyster Creeks. Accounting for the length, wetted perimeter and lake dimensions in these segments, the total seepage area is 680 acres, resulting in an estimated annual loss of 3,600 acre-feet per year.

A similar method was initially used to calculate the seepage rate in the Industrial Reservoir. During the period July 6 to August 6, 1998, the inlet canal was closed and the reservoir level fell 3.5 feet (an approximate loss of 3,150 acre-feet). Metered outflows accounted for 2,858 acre-feet of this, and the remaining 292 acre-feet is equal to 3.9 inches of evaporation and seepage, which is lower than the average July evaporation.

The seepage was then recalculated using data available in the Galveston County Soil Survey. Assuming the average peak permeability of the soils under the reservoir (0.2 inches per hour), the maximum seepage rate of 0.14 acre-feet per day was determined. This equals 51.1 acre-feet per year, which is less than one inch of loss from a 900 acre reservoir, and is consistent with the

observed data. Because these rates are so low, the seepage from under the Bypass and Discharge Canals was assumed to equal zero.

Using the same method, the losses under the American, Briscoe and GCWA Canals were estimated using the average peak permeability of 0.77 inches per hour, a soil thickness of 5.2 feet and a total canal system length of 107 miles. This method produced a canal system loss of 24.7 acre-feet per day, or 9010 acre-feet per year.

#### 2.3.5. Overflows

Two types of overflows can occur in the canal system, controlled and uncontrolled. Controlled overflows occur only in System A, at the spillway dam on Jones Creek and at Dam 3 on Oyster Creek. The spillway holds water for the transition from Jones to Oyster Creek. The transition gates are adjusted daily to allow only the water pumped at the Shannon Pump Station to flow into Oyster Creek. Excess flows due to runoff are allowed to spill over the dam and continue down Jones Creek. Likewise, Dam 3 holds water in Oyster Creek to ensure that the suction bells at the Second Lift Pump Station are submerged. The dam gates are adjusted daily to ensure a constant inlet elevation of 70.3 feet in Oyster Creek. During periods of rain, excess runoff is allowed to spill over the dam and continue downstream.

Controlled overflows were calculated using daily records of spill depths over dams. The Jones Creek spillway was assumed to act as a sharp crested weir, which uses the equation:

$$Q = 2/3 w (2g)^{0.5} (0.604 + 0.81H/W)(H + 0.0034)^{1.5}$$

where: Q = flow (cubic feet per second)

W = dam width (feet)

g = gravity (32.2 ft/sec<sup>2</sup>)

H = height of the water minus the height of the weir (feet)

W = the height of the weir (feet).

Overflows at Dam 3 are not metered, and the responsiveness of the gate adjustments to level fluctuations prevents calculating losses from historic data. Therefore, spills at this dam were assumed to equal the net system loss at that point (i.e., pumping at Shannon plus rainfall inflows, minus evaporation, seepage, customer withdrawals, storage, spills into Jones Creek and pumping at Second Lift).

Uncontrolled overflows occur when water overtops the levee, flowing out at a point other than into a natural channel. None were recorded during 1996 and 1997, so no estimate is included in the balance. Potential overflow locations were identified using the HEC-RAS model (Section 3.2). Although flows into Lateral 10 are shown as losses for System A, they are shown as gains for System B. Therefore, there is no net gain or loss from the overall system.

Overflows into Jones and Oyster Creeks were estimated at approximately 1,400 and 6,100 acre-feet, respectively, in 1996, and approximately 8,100 and 4,600 acre-feet, respectively, in 1997.

## 2.4 COMBINED RESULTS

The following paragraphs summarize the water balance estimates for 1996 and 1997.

### 2.4.1. 1996 Results

The water balance for 1996 is shown in Table 2-2. A total of approximately 144,000 acre-feet of water were pumped from the Brazos River, and 120,400 acre-feet were delivered to customers. Water diverted under Permit 1467 is estimated at 3,400 acre-feet, as calculated by subtracting spills from runoff in Jones and Oyster Creeks. After accounting for gains and losses, inflows exceeded system losses by an estimated 14,500 acre-feet, or 12 percent of the total amount delivered. This may be due to one, all, or a combination of the following factors.

First, calculated pumping volumes may be incorrect. The diverted amount at the Shannon Pump Station was calculated using daily flume readings, which are assumed to be fairly accurate. The rates used at the Second Lift and Briscoe Pump Stations were the GCWA tabulated rates, adjusted upwards to match available pump curves. A five percent error in pumping rate could



affect results by over 7000 acre-feet per year. The pumping rates should be verified and monitored with properly installed and calibrated flow meters, and the diversion rate tables corrected, if necessary.

**Table 2-2**  
**1996 Water Balance**

Segment	Inflow	Runoff	Net Evap.	Seepage	Delivery	Spills	Storage	Outflow	Other Losses
Jones Creek	54,982.4	2,826.8	25.8	759.6	0	1,421.2	0	55,602.4	0
Oyster Creek	55,602.4	8,067.1	94.4	2,818.3	717.0	6,116.2	-67.4	53,991.0	0
American Canal	53,991.0	0	27.2	2,711.3	3,123.7	589.4 to Lat 10	0	46,773.0	0
Lateral 10	589.4	0	4.3	547.3	0	0	0	0	0
Briscoe Canal	89,393.0	911.5	60.2	4,285.9	38,834.6	0	0	44,852.5	0
GCWA Canal	91,625.5	0	17.0	1,465.1	1,405.3	0	0	87,854.5	0
Bypass Canal	236.5	0	1.9	0	0	0	0	0	0
Reservoir	87,618.0	0	162.0	51.1	0	0	810	77,192.9	14,464.0
Discharge Canal	77,192.9	0	7.0	0	76,317.7	0	0	0	0
<b>Totals</b>	<b>144,375.1</b>	<b>11,805.4</b>	<b>399.8</b>	<b>12,638.6</b>	<b>120,398.4</b>	<b>7,537.4</b>	<b>742.6</b>	<b>0</b>	<b>14,464.0</b>

\* Total inflow reflects only pumping from the Brazos River. All other inflows are carried from previous segments.

\*\* All units in acre-feet.

In addition, reported deliveries may be incorrect. Deliveries are based on billing records for metered customers and estimates for unmetered customers. According to GCWA, there is no program to calibrate or check meters. Therefore, there could be errors in the meter readings. Nearly 19,000 acre-feet of irrigation deliveries (16 percent of total deliveries) were unmetered in 1996 and based upon estimates. Also, irrigation deliveries in 1996 were significantly larger than in 1997 (28,000 acre-feet vs. 11,000 acre-feet), yet the total annual deliveries for these years are effectively equal.

Finally, the collected runoff and dam spill amounts are based on numerous assumptions, due to the lack of available measurement records. Runoff collected in Jones Creek, which was calculated empirically, is only two percent of the total amount delivered. It would take a very large error in this estimate to produce a significant change in the overall balance. Due to the practice of adjusting Dams 2 and 3 during rain events, empirical calculation of dam spills and

collected runoff was not possible for Oyster Creek. Although estimated runoff into Oyster Creek (8,100 acre-feet, or 7 percent of total deliveries) and overflows (6,100 acre-feet, or 5 percent of total deliveries) appear to be significant, they tend to cancel each other.

Metering overflows would eliminate one of these unknowns, and allow runoff to be calculated as the net gain to the system. Runoff gains elsewhere in the system also could not be determined empirically. Because the locations of these inflows are known, they could be temporarily metered to determine precipitation to runoff relationships, as was done for Jones Creek.

#### 2.4.2. 1997 Results

The water balance for 1997 is shown in Table 2-3. A total of approximately 117,600 acre-feet of water was diverted from the Brazos River, and 120,300 acre-feet was delivered to customers. Water diverted under Permit 1467 is estimated at 9,800 acre-feet. After accounting for gains and losses, inflows exceeded system losses by approximately 1,800 acre-feet, or 1.5 percent of total deliveries. This error may again be due to errors in calculating pumping, deliveries and runoff.

**Table 2-3**  
**1997 Water Balance**

Segment	Inflow	Runoff	Net Evap.	Seepage	Delivery	Spills	Storage	Outflow	Other Losses
Jones Creek	24,034.6	5,890.8	-326.0	759.6	0	8,065.6	0	21,100.2	0
Oyster Creek	21,100.2	16,664.6	-1190.3	2,818.3	694.6	4,586.5	-96.4	31,278.00	0
American Canal	31,278.0	0	-343.5	2,711.3	1,465.7	531.4 to Lat 10	0	26,146.7	0
Lateral 10	531.4	0	-53.7	547.3	0	0	0	0	0
Briscoe Canal	93,554.0	2,565.9	-759.1	4,285.9	34,013.4	0	0	57,974.2	0
GCWA Canal	84,120.9	0	-214.1	1,465.1	155.9	0	0	81,830.4	0
Bypass Canal	211.3	0	-23.3	0	0	0	0	0	0
Reservoir	81,619.0	0	-2043.0	51.1	0	0	441	84,794.4	1,771.7
Discharge Canal	84,794.4	0	-87.9	0	84,014.1	0	0	0	0
<b>Totals</b>	<b>117,588.6</b>	<b>25,121.3</b>	<b>-5040.9</b>	<b>12,638.6</b>	<b>120,343.7</b>	<b>12,652.1</b>	<b>344.6</b>	<b>0</b>	<b>1,771.7</b>

\* Total inflow reflects only pumping from the Brazos River. All other inflows are carried from previous segments.

The need for accurate runoff and dam overflow information stands out in this case. Since 1996 was a dry year, runoff was small and, therefore, any associated error would be expected to be small. Since 1997 was a wet year, errors in runoff estimates would be magnified.

Also, this reduced amount of unaccounted water corresponds to reduced irrigation sales in 1997. The difference between the two years may be due to a difference between actual and estimated irrigation deliveries.

#### 2.4.3. Conclusions

The results of the water balance demonstrate the need for additional metering at the pump stations and within the canal system. Metering at pump stations would provide more accurate calculation of pumped diversion volumes. System losses, especially overflow losses, were estimated from historic data. Flow or level meters at the Jones Creek Spillway and Dam 3 on Oyster Creek would allow more accurate accounting of losses. Metering at canal junctions would also facilitate better identification of gain and loss locations and amounts. Improved delivery meter accuracy and metering of irrigation customers would improve the accuracy of these estimates and may reduce usage. While the current losses do not hinder the delivery of water to customers, loss reductions would allow a corresponding reduction in energy used for pumping.

Net evaporation varies, but on average produces a gain of 0.2 feet per year (350 acre-feet per year across the system). Seepage and evaporation are relatively constant conditions that will not change significantly at higher pumping rates. However, they do reduce the effective ability of the GCWA to deliver water to customers. Of the 269,600 acre-feet per year (240.64 MGD) the authority may divert under permits and contracts from the Brazos River, Jones Creek and Oyster Creek, only 257,300 acre-feet (229.66 MGD) is available for customers after adjusting for seepage and evaporation. This loss rate is acceptable at less than five percent of the total permitted diversions.



Two components were addressed in determining the capacity of the GCWA Canal System. First, the water pumping capacity of the pump stations was evaluated. Second, the water carrying capacity of each canal was modeled. The maximum capacity of each was determined independently, then the results were combined to determine the effective capacity of the system. Finally, pumping efficiency was addressed to optimize the use of this system.

### **3.1 PUMP CAPACITY**

At all three stations, each pump runs at a fixed speed. Elevation data, power usage and pumping records were used to estimate the capacity of each pump within the system. When possible, pump curves were obtained from the manufacturer to confirm calculated lifts and efficiencies. The pumps were generally found to be well maintained and operating at better than 70% efficiency. This study confirmed the estimates of pumping rates currently being used by the GCWA. However, as discussed in Section 2.4.3, better flow measurement will make these estimates more accurate.

#### **3.1.1 Shannon Pump Station**

The Shannon Pump Station consists of four pumps, three centrifugal and one vertical turbine. A Parshall flume is installed approximately one mile below the pump station, and is used to determine daily flow from the station. According to GCWA, flow meters are scheduled for installation in the near future.

Curves were obtained for only the Johnston pump (see Appendix E). By calculating the total displacement head and energy used by each pump, the pumping rates shown in Table 3-1 were determined.

The nameplates for the two Dayton pumps list 27.5 feet of total dynamic head (TDH). When the river stage meets that condition, Pump #2 matches the rated pumping capacity, and Pump #1 is within ten percent of the rated capacity. The Worthington pump did not have a listed TDH. It is assumed that it is designed for a different TDH, due to the low efficiency calculated at a river stage of 66.4 feet (the design elevation for the Dayton pumps).

Table 3-1  
Estimated Pumping Rates – Shannon Pump Station

Pump	Rated Capacity (gpm) *	GCWA Estimated Capacity (gpm)	Calculated Capacity, 100% efficient (gpm)	Calculated Efficiency
#1 Dayton	50,000	46,393	53,945	86%
#2 Dayton	50,000	50,000	58,160	86%
#3 Worthington	41,000	53,281	69,035	77%
#4 Johnston	90,000	60,000	91,500**	80%

\* All rates are for 66.4 foot inlet elevation.

\*\* Pumping data not available, but curve shows 91,500 gpm and 80% efficiency for the installed conditions.

The GCWA estimates pumping at this station using daily Parshall flume measurements. By isolating periods with only one pump in use, pump efficiency was calculated for each rate and river elevation, assuming a constant horsepower. The data were plotted for Pump #2, producing a calculated pump curve (see Appendix E). Insufficient data were available to plot curves for the other pumps. The calculated efficiencies for Pump #2 are reasonable (87% maximum), given that it was recently rebuilt.

Energy usage records indicate that the motors for Pumps #1 and #2 are apparently operating between 370 and 400 hp, instead of the rated 450 hp. The motor for Pump #3 is rated at 400 hp, but apparently using 510 hp of electricity. Data were not available for Pump #4. The apparent discrepancy between rated and actual horsepower based on power usage may be due to the limited accuracy in reading daily power usage. The meter measures power in increments of 1600 kWh, which equals almost five hours of motor use.

### 3.1.2 Second Lift Pump Station

The Second Lift Pump Station consists of four pumps, two centrifugal and two vertical turbine. A flow meter has recently been installed in the discharge channel, but is not yet calibrated. The GCWA estimates flows by using average rates from previously metered periods. Curves were obtained for two of the pumps (see Appendix E). By calculating the total dynamic head and energy used by each pump, the pumping rates indicated in Table 3-2 were determined.

**Table 3-2**  
**Estimated Pumping Rates – Second Lift Pump Station**

Pump	Rated Capacity (gpm)	GCWA Estimated Capacity (gpm)	Calculated Capacity, 100% efficient (gpm)	Calculated Efficiency
#1 Dayton	42,000	57,916	111,595	52%
#2 Dayton	42,000	64,297	109,974	59%
#3 Lo-Lift	42,000	42,993	64,507	67%
#4 Fairbanks	31,000	29,650	44,253	67%

The nameplates for the two Dayton pumps list 24 feet of total displacement head (TDH). The installed pumps were estimated to have an actual displacement head of 11.5 feet, leading to the increased capacity. These pumps were likely designed to meet seasonal low water levels, but are running at decreased efficiency at the managed inlet depth. Pump curves were available for the Lo-Lift and Fairbanks pumps. For these installations, the curves indicate rates of 49,800 gpm and 33,000 gpm respectively. These values exceed the recorded rates by approximately 10 percent, which indicates that the estimated pumping rates are low. For the water audit, calculated pumping from this station was increased by 10 percent to match the available pump curves.

The energy usage records for the Second Lift indicate that the motors for Pumps #1 and #2 are operating at approximately 320 hp, which is significantly low for the 500 hp rating on Pump #1, but close to the 350 hp rating on Pump #2. The motor for Pump #3 is rated at 350 hp, but is only using 200 hp of electricity. The motor for Pump #4 is using 135 hp of electricity, which is half of the rated 350 hp. The differences between rated and actual energy usage are explained by the accuracy of the power meter (measuring in 600 kWh increments) and by the recent installation of automated gates in Dam #3, which maintain water level for the pump inlets. The pumps were likely installed to overcome seasonal low water levels. The new gate system allows the GCWA to maintain the inlet canal at a constant elevation of 70 feet msl, although the intake bells reach ten feet below that level. The increased suction head reduces the energy required, but results in the pumps operating out of their design head range. The available pump curves confirm the reduced efficiency and energy for the current conditions. Trimming the pump impellers (reangling the blades) can reclaim this efficiency by increasing pump capacities.



**3.1.3 Briscoe Pump Station**

The Briscoe Pump Station consists of three centrifugal pumps. Curves were not available for them. According to GCWA, flow meters are scheduled for installation in the near future. By calculating the total displacement head and energy used by each pump, the pumping rates shown in Table 3-3 were determined.

**Table 3-3**  
**Estimated Pumping Rates – Briscoe Pump Station**

Pump	Rated Capacity (gpm) *	GCWA Estimated Capacity (gpm)	Calculated Capacity, 100% efficient (gpm)	Calculated Efficiency
#1 Dayton **	70,000	70,000	96,099	73%
#2 Dayton **	70,000	70,000	96,099	73%
#3 Dayton **	70,000	70,000	96,099	73%

\* All rates are for 27-foot inlet elevation.

\*\* Individual energy use data were not available, so pumps were considered equal.

Nameplates and pump curves were not available for these pumps, but the calculated energy usage by these pumps matches the motor rating, leading to the conclusion that the pumps are matched to the installation.

The GCWA estimates pumping at this station using a table of previously metered pumping rates at various river (inlet) stages. Pump efficiency was calculated for each rate and river elevation, and the data was plotted, producing a pump curve (see Appendix E). Calculated efficiencies are lower than expected (73% maximum instead of 85%), indicating that either the historic rates are low or head losses within the pump and piping are greater than estimated. Because these rates were tabulated at the same time as the Second Lift Pump Station rates, they, too, were increased by 10 percent for the water audit. This adjustment raised the peak efficiency to 80%, which is more reasonable.

**3.2 CANAL CAPACITY**

The capacity of each canal segment was determined by using the Hydrologic Engineering Center River Analysis System (HEC-RAS) model, version 2.1. HEC-RAS is a package of hydraulic analysis programs, capable of performing steady flow water surface profile calculations, among

other functions. The system was modeled using canal lengths and cross-sections provided by the GCWA. Average slopes were calculated using available elevation data for the canals. The model requires four channel cross-sections at each restriction (siphons, bridges, etc.). These were estimated from data provided by the GCWA. Abrupt transitions from channel cross-sections to restriction cross sections were assumed in all cases.

Clean, unsilted capacities were estimated for no freeboard and one foot of freeboard in the limiting segment of each canal. To approximate the effects of silt, the channel bottoms were raised one foot at a point 50 feet downstream of each culvert/siphon and sloped to the next cross-section. Further sensitivity studies were performed on the Briscoe Canal to determine the reduction in canal capacity due to additional silt in the channel. When modeled with two feet of silt, the flow reductions were 2.5 times the reductions with one foot of silt. The addition of silt did not change the location of the limiting restriction. Evaporation and seepage losses were not considered during any of the capacity analyses.

The results of these analyses are summarized in Table 3-4, displayed graphically in Appendix F and discussed in the following subsections.

**Table 3-4**  
**Summary of Canal System Capacities**

Reach	Clean Capacity*		Capacity with One Foot of Silt			Controlling Restriction
	(cfs)	(average MGD)	(cfs)	(average MGD)	Reduction (%)	
A-1	270	174.5	200	129.3	25.9	Jones to Oyster Creek
A-2 – up	340	219.8	305	197.1	10.3	Cartright Road - Bridge 57
A-2 – middle	200	129.3	150	96.9	25.0	FM 1128 – Bridge 77
A-2 – down	155	100.2	130	84.0	16.1	Blackey Bridge - Bridge 87 & then 88
Lateral 10	165	106.6	165	106.6	0.0	Bridge 7
B – up	410	265.0	390	252.1	4.9	FM 1462 crossing - Bridge 23
B – middle	450	290.8	450	290.8	0.0	Connection with Ranch Canal
B – down	390	252.1	340	219.8	12.8	Holloway Road - Bridge 41
Monsanto	180	116.3	175	113.1	2.8	Head of Monsanto
Ranch	160	103.4	150	96.9	6.3	Cloud Bayou U16
Galveston – up**	100	64.6	100	64.6	0.0	Check #3
Galveston – down	510	329.6	495	319.9	2.9	Cemetery Road - Bridge 11
Bypass	235	151.9	220	142.2	6.4	Bridge 1

\*Represents clean, unsilted capacity with one foot of freeboard.

\*\*Maximum flow increases to 255 cfs by changing Check #3 to a 6-foot culvert.

**3.2.1 System A**

As discussed in Section 1.1.1, System A consists of the Shannon and Second Lift Pump Stations, Jones and Oyster Creeks, and the American Canal. The following paragraphs describe the capacity in each segment of System A.

**3.2.1.1 Jones and Oyster Creeks**

Jones Creek is a natural channel and not normally susceptible to overflows. Oyster Creek is a natural channel that passes through Sugar Land and Missouri City. It serves six irrigation customers and supplies water to eight man-made lakes. The water level in the lakes along Oyster Creek is managed using Dam #2 to maintain a certain level and to prevent overflows into residential areas. The water level at the Second Lift Pump Station is managed using Dam #3 to maintain a constant suction head for the pump intakes.

The capacity of Jones and Oyster Creeks is limited by the capacity of the five-gate transition between the two, which is 270 cfs (174.5 MGD). Flows greater than 270 cfs spill over Dam #1 and return to the Brazos River via Jones Creek. When reduced (silted) conditions were modeled, overflows occurred at 200 cfs (129.3 MGD). The capacity does not limit peak withdrawal rates at the Second Lift Pump Station because of storage in the lake system. The ultimate capacity of the segment is approximately 2000 cfs, assuming the dam can be raised and the transition gates expanded.

**3.2.1.2 American Canal**

The American Canal is a man-made above grade channel supplying one industrial and numerous irrigation customers. The capacity of the canal (without freeboard) is estimated at 395 cfs (255.3 MGD) above Lateral 10, with a limiting restriction at Bridge 57. At one foot of freeboard, the canal capacity is 340 cfs (219.8 MGD). Below Lateral 10, the levee height is reduced, resulting in an estimated capacity of only 235 cfs (151.9 MGD) with no freeboard, and 200 cfs (129.3 MGD) with one foot of freeboard. Below the GCWA Canal, the limit is 175 cfs (113.1 MGD) with no freeboard, and 155 cfs (100.2 MGD) with one foot of freeboard. The limiting restrictions in that segment are the culverts under Bridges 87 and 88.



When the system was modeled with one foot of silt loading in the channels, the estimated capacity with 1 foot of freeboard fell to 305 cfs (197.1 MGD) above Lateral 10, 150 cfs (96.9 MGD) below Lateral 10, and 130 cfs (84.0 MGD) below the GCWA canal.

#### 3.2.1.3 Lateral 10

Lateral 10 is a man-made above grade channel used to transfer water from System A to System B, and also to supply several irrigation customers. The capacity of the canal (without freeboard) was estimated to be 185 cfs (119.6 MGD), with a limiting restriction at Bridge 7. At one foot of freeboard, the canal capacity is 165 cfs (106.6). With one foot of silt, the capacity remained 165 cfs. Lateral 10 was modeled with the American Canal. The model indicates that the upstream conditions in the American Canal prevent raising the water level above the modeled elevation, so 165 cfs can be considered the ultimate capacity of this segment. The level of the Briscoe Canal also affects the flow, but the system was not modeled as a whole.

#### 3.2.2 System B

As discussed in Section 1.1.2, System B consists of the Briscoe Pump Station, Briscoe, Monsanto and Ranch Canals, and joins the Galveston Canal. The following paragraphs describe the capacity in each segment of System B.

##### 3.2.2.1 Briscoe Canal

The Briscoe Canal is a man-made above-grade channel supplying three industrial and numerous irrigation customers. The capacity of the canal (without freeboard) was estimated at 450 cfs (290.8 MGD) above Ranch Canal, with a limiting restriction at Bridge 23 (FM 1462 Crossing). At one foot of freeboard, the canal capacity is 410 cfs (265.0 MGD), and with one foot of silt it becomes 390 cfs (252.1 MGD). Below Ranch Canal, the capacity is 450 cfs with no freeboard, 390 cfs with one foot of freeboard, and 340 cfs (219.8 MGD) with one foot of silt. The limiting restriction in that segment is the culvert under Bridge 41 (Holloway Road).

A sensitivity study was performed on the Briscoe Canal to determine the effects of silt deposited on the channel bottom. A model was created with one foot and another with two feet of sediment added to the channel bottom between structures to determine the new flow capacities.

With one foot of sediment added, the canal's capacity was reduced by up to 10.3% (as detailed above). After depositing two feet of silt into the channel, the capacity was reduced from 390 cfs to 290 cfs, or by 25.6%.

#### 3.2.2.2 Monsanto Canal

The Monsanto Canal is a branch channel off of the Briscoe Canal supplying the Chocolate Bayou and Monsanto reservoirs. The capacity of the canal (without freeboard) was estimated to be 190 cfs (122.8 MGD). With one foot of freeboard, the canal capacity is 180 cfs (116.3 MGD). With one foot of silt in the channel, the capacity is 175 cfs (113.1 MGD).

#### 3.2.2.3 Ranch Canal

The Ranch Canal is a branch channel off of the Briscoe Canal supplying numerous irrigation customers. The capacity of the canal (without freeboard) was found to be 165 cfs (106.6 MGD), with a limiting restriction at Underdrain 16. With one foot of freeboard, the canal capacity is 160 cfs (103.4 MGD). With one foot of silt in the channel, the capacity becomes 150 cfs (96.9 MGD).

#### 3.2.3 GCWA Canal

The GCWA Canal is a man-made above-grade channel connecting Systems A and B with the Industrial Reservoir. This stretch of the canal was modeled in two reaches: upstream and downstream of Check 3, located just above the junction with the Briscoe Canal. Check 3 passes all flow through a single 48-inch gate valve. It serves as a major restriction in the canal and thus required a more detailed analysis.

Due to the junction and restriction at Check 3, two scenarios were used to determine the capacity of the GCWA Canal. The first scenario used the Briscoe Canal flowing at capacity and the second scenario allowed no flow through the Briscoe Canal. Two options for reducing the restriction at Check 3 were considered.

Under current conditions, the capacity of the upper reach varied from 100 to 195 cfs, depending on the contributing flow from System B, while the lower reach varied from 235 cfs to a

maximum of 510 cfs. By increasing to a 6-foot culvert at Check 3, the maximum capacity of the upper reach varied from 255 to 395 cfs while the lower reach capacity was between 395 and 510 cfs. By adding the 6-foot culvert next to the 4-foot culvert, the upper reach capacity ranged from 365 to 430 cfs while the lower reach varied from 430 to 510 cfs.

The configuration at the junction does not allow the maximum capacity of both of the reaches simultaneously. The two scenarios in conjunction with the three culvert conditions provide numerous flow combinations in the GCWA Canal. A summary of these conditions is listed in Table 3-5.

**Table 3-5**  
**Summary of Check 3 Capacity Study**

Check 3 Culvert Size (feet)	Capacity (cfs)			
	Upper Reach Governs		Lower Reach Governs	
	Upper	Lower	Upper	Lower
4 ft (existing)	195	235	100	510
6 ft	395	395	255	510
4 ft & 6 ft	430	430	365	510

\* All flows are for one foot of freeboard.

Under current conditions with the Briscoe Canal at maximum capacity (390 cfs), the capacity of the lower reach of the GCWA Canal is 510 cfs (329.6 MGD) while the upper reach is limited to 100 cfs (64.6 MGD) due to the head created by the Briscoe Canal. When the Briscoe Canal provides no flow, the lower reach of the GCWA Canal allows 235 cfs (151.9 MGD), and the upper reach's capacity increases to 195 cfs (126.0 MGD). When modeled with one foot of silt, the upper reach was unchanged, but the capacity of the lower reach fell to 495 cfs (319.9 MGD).

The model supported the observation that Check 3 served as a large restriction for this segment of the canal system. The canal capacity increased greatly by replacing the 4-foot pipe culvert at Check 3 with a 6-foot pipe culvert. When the Briscoe Canal was flowing at capacity, the lower reach of the GCWA Canal remained at 510 cfs while the upper reach increased to 255 cfs. When the Briscoe Canal supported no flow, the GCWA Canal maintained a maximum capacity of 395



cfs for both reaches. The canal capacity increased even more by adding the 6-foot culvert along side the 4-foot culvert (instead of replacing it). The lower reach sustained its 510 cfs capacity while the upper reach increased to 365 cfs when the Briscoe Canal was flowing at capacity. The GCWA Canal, as a whole, increased to a capacity of 430 cfs when the Briscoe Canal conveyed no flow. In summary, as the flow through the Briscoe Canal decreases, the allowable flow through the upper reach increases.

This portion of the study determined that a 6-foot culvert at Check 3 should replace or supplement the current 4-foot culvert. This adjustment would increase the GCWA Canal's capacity two to three fold and Check 3 would no longer be the limiting restriction of the system.

#### 3.2.3.1 Bypass Canal

The Bypass Canal allows flows directly from the GCWA canal into the Discharge Canal without passing through the Reservoir. It is primarily used to maintain system operations while Reservoir levels are reduced for required maintenance. The Bypass Canal was found to be capable of carrying 235 cfs (151.9 MGD) with one foot of freeboard, and 220 cfs (142.2 MGD) with one foot of silt. This is less than the flow capacity of the GCWA canal. Therefore, flows must be routed through the Reservoir when the GCWA is flowing at or near capacity.

Flow through this segment is dependent upon the level of the Discharge Canal. This effect is not reflected because the segment was modeled independently to determine its maximum capacity. Its integrated capacity was observed during the maintenance period in July 1998 when the Bypass Canal carried an average of 90 cfs (58.7 MGD).

#### 3.2.3.2 Industrial Reservoir

The Industrial Reservoir was originally designed to hold 7,308 acre-feet of water, at an average depth of 8.1 feet. The GCWA had the reservoir sounded recently and found silting along the levees, but no significant loss of capacity. The reservoir is located to meet peak municipal and industrial water demands, and to allow time for maintenance of the GCWA canal. At an average outflow and seepage rate of 300 acre-feet per day, approximately 24 consecutive days of maintenance can be performed on the canals.

### 3.2.3.3 Discharge Canal

The Discharge Canal that delivers water from the Industrial Reservoir to the Water Treatment Plant and the Industrial Pump Station was previously studied and determined to have a capacity of 116 cfs (75 MGD), with the potential to carry 186 cfs (120 MGD) if certain improvements were made. The required flow through this segment is equal to the Water Treatment Plant and Industrial Pump Station customer needs.

## 3.3 EFFECTIVE CAPACITY

The effective capacity of the system to deliver water was determined by identifying the limiting pump station or canal segment in the system. Capacities reflect clean, unsilted conditions. Water losses to seepage and evaporation were accounted for in each segment.

### 3.3.1 System A

System A, without discharge into Lateral 10, can carry 89 cfs (57.5 MGD) to the Industrial Reservoir when the Briscoe Canal is running at capacity. This accounts for 11 cfs in losses. When the Briscoe Canal flows at 40 cfs (25.9 MGD), System A can convey 184 cfs (118.9 MGD). The limiting restriction is the 48-inch gate valve at Check 3 in the GCWA Canal. If water is transferred to System B using Lateral 10 and System B contributes only 40 cfs to the GCWA Canal, the total delivery capacity increases to 326 cfs (210.7 MGD), which is the limit of the American Canal above Lateral 10.

### 3.3.2 System B

System B can deliver 383 cfs (247.5 MGD) to the Industrial Reservoir. This includes 7 cfs in losses. The limiting restriction is Bridge 41, approximately two miles before the junction with the GCWA canal. System B can deliver an additional 20 cfs to customers above Ranch Canal.

### 3.3.3 Total Capacity

The total capacity of the GCWA Canal System is 473 cfs (305.7 MGD), with the GCWA Canal from Check 3 to the Reservoir being the limiting segment. This includes 17 cfs in losses. This

flow greatly exceeds the required average rate of 137 cfs (211.5 MGD), but is significantly less than the maximum permitted rate of 1,345 cfs (869 MGD).

#### 3.4 PUMPING EFFICIENCY

The GCWA Canal System is primarily gravity driven, making it very energy efficient. To maximize this efficiency, the system was analyzed to determine which pumping station delivers water at the lowest cost.

System A supplies customers along Oyster Creek, the American Canal and Lateral 10. Pumping from the Brazos River at the Shannon Pump Station plus collected runoff must therefore meet the contractual requirements for these customers, plus any requirements on or below the Galveston Canal not met by System B. Pumping at the Second Lift Pump Station must equal the pumping at Shannon less the losses and deliveries along Oyster Creek.

System B supplies customers along the Briscoe Canal, and any requirements on or below the Galveston Canal not met by System A. The system receives inflow from System A at Lateral 10. Therefore, the Briscoe Pump Station must, as a minimum, divert enough water to meet the contractual needs of those customers above Lateral 10. The total diversion at both stations can be established to optimized energy efficiency.

To compare costs of the two systems, the Industrial Reservoir was used as a common delivery point, and customer diversions above the reservoir were ignored. Between the Shannon Pump Station and the Industrial Reservoir, system losses to net evaporation and seepage average 11.2 cfs. Deliveries to the reservoir, then, are equal to the pumping rate minus 11.2 cfs. The cost of this water is equal to the cost of the energy used at the Shannon Pump Station plus the energy used at the Second Lift. Similarly, deliveries from System B equal pumping at the Briscoe Pump Station minus average losses of 6.9 cfs. The cost of this water equals the cost of the energy used at the Briscoe Pump Station.

Pumping energy required is calculated as:

$$HP = Qh/3960e$$

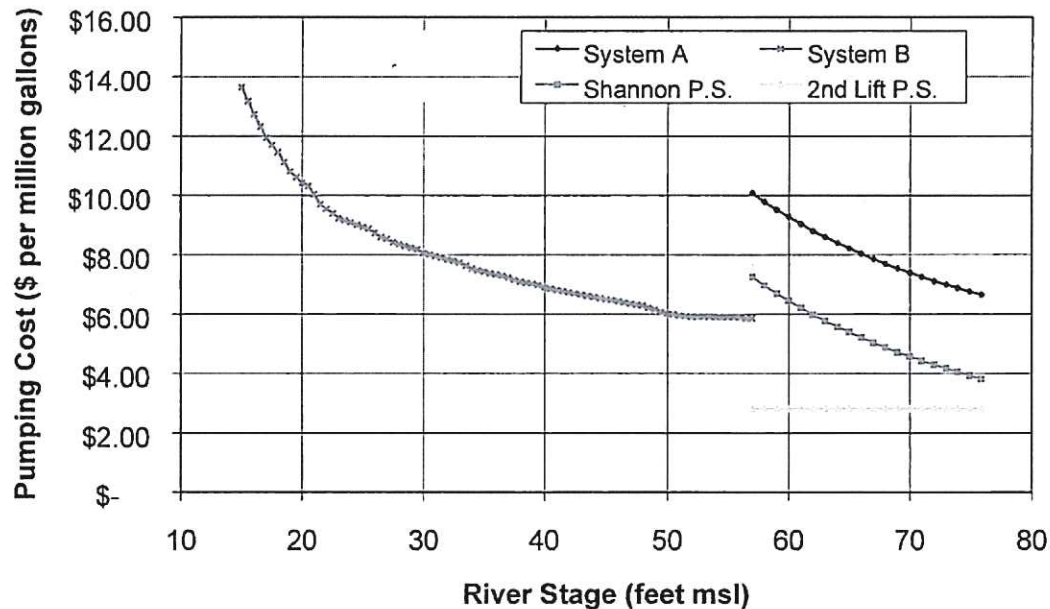


Where:      HP = energy used to pump water (horsepower)  
              Q = flow (gpm)  
              h = displacement head (feet)  
              e = pump efficiency.

Because the motors run at fixed speed, the hourly energy cost per pump is fairly constant, but the flow rate varies due to changes in lift. By using historic pumping rates at observed river stages and observed energy usage rates, pump efficiencies were determined, as shown in the calculated pump curves in Appendix E. For the Shannon Pump Station, Pump 2 was used to calculate costs because its efficiencies were known. By dividing the energy cost for Pump 2 (using observed energy usage and assuming the HL&P rate of \$0.046 per kWh) by the pumping rate at various river stages, costs were found to range from \$3.83 to \$7.25 per million gallons delivered to the Reservoir. Pumping costs at the Second Lift are constant due to the steady inlet conditions, but vary by pump from \$2.60 to \$3.16. They average \$2.82 per million gallons transferred. The total delivery cost for System A is equal to the cost at Shannon plus \$2.82, as is plotted in Figure 3-1. Similarly, the cost of delivering water using System B was determined to range from \$5.87 to \$13.64, and is also plotted in Figure 3-1.

Although System A requires passing water through two pump stations, it is sometimes more energy efficient than System B. This is due to the change in elevation of the Brazos River from the Shannon Pump Station to the Briscoe Pump Station and the differing pump efficiencies at the various stations. Water diverted using System A costs from \$6.65 to \$10.07 per million gallons. At times when the river stage at the Briscoe Pump Station is 20.5 feet or lower, it costs less per gallon to divert water using System A. At times when the river stage is at 43.5 feet or higher, it is more cost effective to divert water using System B. In the range between those two conditions, the cost at each station may be determined from Figure 3-1 and the optimum system selected.

### Pumping Cost vs. River Stage



Note: Cost is in terms of dollars per million gallons delivered to the Industrial Reservoir.

It should be noted here that the pump efficiencies at the Second Lift are very low, and can be increased by trimming the impellers. Once this is accomplished, the costs of using System A will decrease, narrowing the range of conditions where System B is less expensive. Also, the water diverted from Oyster Creek under permit 1467 currently costs only \$3.01 per million gallons delivered to the Industrial Reservoir. This source is significantly less expensive and should be monitored to ensure maximum utilization.

The following recommendations are made to improve the operation of the GCWA Canal System, and to provide better data for estimating the capacity of the system components.

#### 4.1 METERING

Accurate metering of the GCWA Canal System stands out as a needed system improvement. Currently, the only automated metering is on the Discharge Canal from the Industrial Reservoir. Flow measurement at the Shannon and Briscoe Pump Stations is recommended to accurately report withdrawals from the Brazos River to the TNRCC and to provide the basis for a more accurate water balance. Measurements along the canal system would facilitate system management and determination of inflows and outflows. More accurate metering of customer deliveries would improve accounting and may reduce usage.

##### 4.1.1 Pump Station Metering

Current attempts at pump station metering have had limited success due to high silt loads and other debris in the water. The plastic blades on propeller type meters quickly wear out, and grass and other debris often clog the leads on electric velocity meters. A Parshall flume at the Shannon Pump Station is recorded manually, but the canal conditions are such that running two pumps submerges the flume.

The layout of all three stations prevents the installation of magnetic or ultrasonic flow meters, because these on-pipe meters require a straight run length of approximately ten pipe diameters for accuracy. None of the stations have straight pipe runs of that length.

One possible solution is to use a propeller type velocity meter at a known channel cross section, and temporarily monitor the flow from each pump separately, and from combinations of pumps. These empirically determined pumping rates could then be used to calculate annual diversions at the station based on pump run times. Rates could be verified every six months with minimal wear on the meter. At the Shannon and Briscoe Pump Stations flows are dependent on river stage. These updated measurements would allow annual verification or recalculation of the river stage to flow relationship.



Another solution would be to install self-cleaning flumes and level gauges below each pump station. Properly sized flumes would provide valid flow measurement under all operating conditions with minimal maintenance requirements.

Another, but more expensive solution would be to install multi-point ultrasonic flow meters in the pump intake or discharge lines. These flow meters do not require the normal upstream and downstream unobstructed flow distances to develop laminar flow necessary for accurate measurement.

#### 4.1.2 Canal Metering

Canal metering would enhance system management by allowing the canal manager to maximize use of System B, which has a greater carrying capacity than System A. Also, many customers are located along branch canals, such as the Ranch Canal. Metering the flow into these canals would allow more accurate billing of irrigation customers. Canal metering in association with pump station metering would allow more accurate estimation of evaporation and seepage losses.

Loss metering would also be beneficial. Monitoring and recording the spill losses at the Jones Creek spillway and Dam 3 on Oyster Creek would facilitate better runoff estimates, which would aid in diverting more water under Permit 1467. Losses at the Jones Creek spillway could be accurately estimated using a level meter. Losses at Dam 3 might be calculated without additional equipment, if the current dam controller can be programmed to record water and gate elevations.

Canal metering is most easily achieved by locating metering devices at inverted siphons, which ensures a known cross-section and full flow at all times. Locations must have access to a power source, as well as telephone lines if remote monitoring is desired. Recording stations would serve for branch canals, which do not affect system throughput. The canal locations listed in Table 4-1 are recommended as potential monitoring sites.

**Table 4-1**  
**Summary of Recommended Canal Flow Monitoring Locations**

Canal	Location	Type Device	Reason
Jones Creek	Spillway Dam	Level meter	Measure spills
Oyster Creek	Below Dam #3	Flow meter	Measure spills
American Canal	Below Second Lift	Parshall flume & level meter	Measure pumped amounts
American Canal	Bridge 83 (Hwy 35)	Flow meter	Measure flow below Lat 10
Lateral 10	Bridge 8 (Hwy 6)	Flow meter	Measure flow to System B
Briscoe Canal	Below Briscoe P.S.	Parshall flume & level meter	Measure pumped amounts
Monsanto Canal		None	Already metered
Ranch Canal	Bridge 32	Flow meter	Measure flow to customers
GCWA Canal	Check 3	Flow meter	Measure flow from System A
Bypass Canal	Bridge 1	Flow meter	Measure flow to Water Treatment Plant & Pump Station
Industrial Reservoir	Inlet	Flow Meter	Measure flow into Reservoir
	Outlet	None	Already metered

#### 4.1.3 Customer Metering

Ideally, each customer served by the GCWA should be metered for accurate billing. However, that expense may not be justified for customers who do not purchase water every year. For those who do, two metering options exist.

For take-off pipes that always run full, propeller meters may be installed. Because irrigation is billed annually, these meters can be checked manually, eliminating the power requirement. Take-off pipes that do not run full would require the installation of exit weirs and level meters. This setup would require a power source. Level records would have to be maintained, and the flow across the weir could then be calculated.

Furthermore, it is recommended that all meters be checked and calibrated on a regular schedule. This will ensure accurate billing and may promote water conservation.

#### 4.2 CANAL IMPROVEMENTS

Some potential improvements to the canal system and its operation itself have been identified and are discussed in the following paragraphs.

**4.2.1 Levee Improvements**

The current canal capacities (without considering siphon restrictions) exceed the current pumping capacity of the system. The only segment with a noticeably lesser capacity is the American Canal, with an average levee height of seven feet, as opposed to ten feet throughout the balance of the system. Increasing this levee height one foot would raise the capacity to 250 cfs.

**4.2.2 Channel Improvements**

It is obvious that some canal sections along Jones and Oyster Creeks are overgrown with grass, bushes, and trees. In addition, GCWA indicates that certain sections of the canal system, including the Reservoir, have significant amounts of silt. It is recommended that surveys be performed to identify the locations of greatest silt depth (Section 4.3) and that the annual maintenance budget be increased to provide for routine cleaning and dredging.

**4.2.3 Culvert and Siphon Improvements**

Several improvements were identified to remove the greatest restrictions in the system.

The greatest restriction in the system occurs at Check 3 in the GCWA Canal, where the flow passes through a siphon with a 48-inch gate. By replacing that culvert with a 72-inch pipe, the capacity would increase from 195 to 390 cfs. Adding the 72-inch pipe beside the existing siphon was marginally better.

In the new extension of the American Canal, the single culverts at Bridges 87 and 88 reduce the capacity from 230 cfs to 155 cfs. Adding a second culvert at each bridge would allow the greater flow. This improvement is not recommended, however, because the current capacity greatly exceeds the 1996 irrigation usage in this segment.

In the Ranch Canal, Underdrain 16 at Cloud Bayou restricts flow to 160 cfs. A capacity of 190 cfs could be realized by replacing the current 54-inch culvert with an 84-inch culvert. A capacity of 215 cfs could be realized by further replacing the 60-inch culvert at Underdrain 17 with an 84-



inch pipe. These improvements are not recommended, because the existing canal capacity greatly exceeds the current irrigation demands.

#### 4.2.4 Operational Improvements

As discussed in Section 3.1.2, the centrifugal pumps at the Second Lift Pump Station are not operating efficiently. This is due to the change in suction head resulting from installation of Dam 3. It is recommended that a study be conducted to determine the cost effectiveness of trimming the impellers on these pumps to provide more efficient operation.

As discussed in Section 3.4, it is less costly to operate either the Shannon/Second Lift or Briscoe Pump Stations under certain conditions. It is recommended that, to the extent possible, the guidelines provided become standard operating practice to minimize energy costs.

Finally, it seems possible to increase the water diverted under Permit 1467 by maintaining the water level at Dam 3 at 69 feet instead of 70 feet. This should be achieved by reducing the pumping at the Shannon Pump Station. As discussed in Section 3.1.2, the pumps at the Second Lift will operate more efficiently, and the additional foot of storage will allow you to capture up to 117 acre-feet of water during rain events. If there are ten large rainfalls each year, that would equal 1,170 additional acre-feet of water.

#### 4.3 OTHER RECOMMENDATIONS

All calculations included in this study are based upon canal dimension and elevation estimates based upon data provided by the GCWA. The channels were assumed to be clear and uniform throughout the system. To accurately model the system and account for silt deposits, surveyed cross sections are required for every bridge, siphon, curve, and at intermediate points. The GCWA canal system would require approximately 2,080 cross sections (400 bridge sections, 280 siphon sections, 624 curve sections, and 776 interval sections). Such a survey would require approximately 300 survey-crew days, at an estimated cost of \$300,000.

This survey work could be prioritized and sequenced to provide the most necessary information. First, sections and elevations should be taken at the pump stations and canal junctions to verify the slopes used in the model (approximately 45 cross sections). Then, subsequent sections could be taken in the segments where modeled flow does not match observed flow, or where you would like to model other improvements. In addition, the Texas Water Development Board could perform a hydrographic survey of the Reservoir for as little as \$10,000. The cost and added benefit of this more extensive survey should be compared with the cost for a commercial surveying company.

Finally, estimated seepage rates are based on soil surveys and averaged conditions. To better estimate seepage losses, several methods may be used. If flow meters were installed above and below a given segment, exact flow losses could be identified. The evaporative portion could be identified from other sources, and the seepage rates calculated. Another option is to record the canal level during periods when segments are closed for maintenance. The seepage rates can then be calculated empirically for various sections of the canal.

Gulf Coast Water Authority Materials:

- Annual Water Usage Reports from GCWA to the TNRCC for years 1995, 1996 and 1997.
- Certificates of Adjudication, # 12-5166, 12-5168 and 12-5171, authorizing appropriations of water from the Brazos River, issued by the Texas Water Commission, December 1987.
- Dr. Thomas S. Mackey Water Treatment Plant Capacity Expansion Evaluation, Malcolm Pirnie, 1996
- Gulf Coast Water Authority System Facilities (map book), produced by Walsh Engineering, Inc, May 1995
- GCWA Water Conservation Plan (includes projections through 2020), dated June 1998
- Monthly Billings, 1996 - 1998
- Raw Water Facilities Audit (Conveyance, Storage and Distribution Facilities), Volumes 1 & 2, produced by GCWA, 1995
- Water Consumption Report (summary by customer) for 1994, 1995, 1996, 1997, and 1998 contract.
- Water Treatment Plant Influent Quality Records, 1996 - 1998

Texas Water Development Board, Report 64, "Monthly Reservoir Evaporation Rates for Texas, 1940 through 1965," October 1967

Texas Water Development Board, "Statewide Lake Evaporation Data", TWDB web site, June 1998

USDA Soil Conservation Service, "Soil Survey of Galveston County Texas", Feb 88

USDA Soil Conservation Service, "Soil Survey of Brazoria County," Texas, June 81

USDA Soil Conservation Service, "General Soil Map, Fort Bend County," Texas, July 1979

USGS Topographic Map Sheets, 7.5 Minute Series:

- Fulshear, TX
- Richmond NE, TX
- Clodine, TX
- Sugar Land, TX
- Missouri City, TX
- Almeda, TX
- Pearland, TX

- Juliff, TX
- Manvel, TX
- Algoa, TX
- Dickinson, TX
- Texas City, TX
- Mustang Bayou, TX
- Hitchcock, TX.

University of Texas at Austin, Bureau of Economic Geology, "Geologic Atlas of Texas, Houston Sheet," 1982



*Water Audit and Water Use Projections*  
*Gulf Coast Water Authority*

**Appendix B**  
**Soil Data**

Symbol	Name	Depth	Clay	Minimum Permeability	Maximum Permeability	Limit for ponds/ reservoirs	Limit for levees/ embankmt
		(inches)	(pct)	(in/hr)	(in/hr)		
Ba	Beaumont clay	0-29	40-55	0.06	0.20	Slight	Severe
		29-80	45-60	0.00	0.06		
Be	Bernard clay loam	0-10	27-35	0.06	0.20	Slight	Severe
		10-60	35-60	0.00	0.06		
		60-65	30-60	0.00	0.06		
Bn	Bernard	0-10	27-35	0.06	0.20	Slight	Severe
		10-60	35-60	0.00	0.06		
	Edna	0-8	12-20	0.60	2.00	Slight	Severe
		8-60	35-55	0.00	0.60		
BrA	Brazoria Clay	0-65	60-80	0.00	0.60		
Ed	Edna fine sandy loam	0-8	12-20	0.60	2.00	Slight	Severe
		8-45	35-55	0.00	0.06		
		45-60	35-55	0.00	0.06		
LaA	Lake Charles clay	0-24	40-60	0.06	0.20	Slight	Severe
		24-62	40-60	0.00	0.06		
Le	Leton loam	0-12	10-25	0.06	2.00	Moderate	Severe
		12-60	20-35	0.06	0.20		
Ma	Mocarey loam	0-12	15-27	0.60	2.00	Slight	Severe
		12-22	18-35	0.20	0.60		
		22-52	18-40	0.20	0.60		
		52-60	30-50	0.06	0.20		
Mb	Mocarey	0-11	15-30	0.60	2.00	Slight	Severe
		11-60	18-40	0.20	0.60		
	Algoa	0-12	15-30	0.60	2.00	Slight	Moderate
		12-58	20-35	0.60	2.00		
		58-65	30-50	0.20	0.60		
Mc	Mocarey	0-12	15-27	0.60	2.00	Slight	Severe
		12-16	18-35	0.20	0.60		
		16-60	18-40	0.20	0.60		
	Cieno	0-11	20-30	0.20	0.60	Slight	Severe
11-60		24-35	0.00	0.06			
Mf		Morey	0-11	15-30	0.60		
	11-60		25-35	0.06	0.20		
	Leton	0-12	10-25	0.60	2.00	Moderate	Severe
		12-60	20-35	0.06	0.20		
NoA	Norwood silt loam	0-18	27-40	0.60	2.00	Moderate	Severe
		18-55	18-35	0.60	2.00		
		55-63	10-35	0.60	2.00		
PI	Pleger Clay	0-26	40-60	0.06	0.20	Slight	Severe
		26-50	35-60	0.00	0.06		
		50-64	---	0.00	0.02		
Ve	Verland silty clay loam	0-13	27-40	0.06	0.20	Slight	Severe
		13-62	40-60	0.00	0.06		
		30-60	35-60	0.00	0.06		
Average Permeability:				0.22	0.77		
Substrate	Beaumont Formation	100 ft (+/-)	Low	Moderate			



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Summary Table: 1997 Pumping .....	C-2-1

## 1996 Pumping

Date	Pumps				Pump Hours	Shannon		Gauges		Flume		2nd Lift				Total Pumped acre-feet	Briscoe				Day Total acre-feet	
	#1	#2	#3	#4		Rate cfs	Volume Pumped acre-feet	Suction	Discharge	Up	Down	#1	#2	#3	#4		Pumps		Total Pumped acre-feet	Gauges		
																	Suction	Discharge		Suction		Discharge
1/2/96					0	0	0.00	61	0	0	0					0.00				0.00	0.00	
1/3/96					0	0	0.00	60.9	0	0	0					0.00				0.00	0.00	
1/4/96					0	0	0.00	60.8	0	0	0					0.00				0.00	0.00	
1/5/96					0	0	0.00	60.9	0	0	0					0.00				0.00	0.00	
1/6/96					0	0	0.00	61.1	0	0	0					0.00				0.00	0.00	
1/7/96					0	0	0.00	61	0	0	0					0.00				0.00	0.00	
1/8/96					0	0	0.00	60.7	0	0	0					0.00				0.00	0.00	
1/9/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
1/10/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
1/11/96					0	0	0.00	60.6	0	0	0					0.00				0.00	0.00	
1/12/96					0	0	0.00	60.6	0	0	0					0.00				0.00	0.00	
1/13/96					0	0	0.00	60.6	0	0	0					0.00				0.00	0.00	
1/14/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
1/15/96					0	0	0.00	60.8	0	0	0					0.00				0.00	0.00	
1/16/96					0	0	0.00	60.7	0	0	0					0.00				0.00	0.00	
1/17/96					0	0	0.00	60.6	0	0	0					0.00				0.00	0.00	
1/18/96					0	0	0.00	60.4	0	0	0					0.00				0.00	0.00	
1/19/96					0	0	0.00	60.4	0	0	0					0.00				0.00	0.00	
1/20/96					0	0	0.00	60.4	0	0	0					0.00				0.00	0.00	
1/21/96					0	0	0.00	60.3	0	0	0					0.00				0.00	0.00	
1/22/96					0	0	0.00	60.3	0	0	0					0.00				0.00	0.00	
1/23/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
1/24/96					0	0	0.00	60.4	0	0	0					0.00				0.00	0.00	
1/25/96					0	0	0.00	60.7	0	0	0					0.00				0.00	0.00	
1/26/96					0	0	0.00	60.7	0	0	0					0.00				0.00	0.00	
1/27/96					0	0	0.00	60.7	0	0	0					0.00				0.00	0.00	
1/28/96					0	0	0.00	60.6	0	0	0					0.00				0.00	0.00	
1/29/96					0	0	0.00	60.3	0	0	0					0.00				0.00	0.00	
1/30/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
1/31/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/1/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/2/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/3/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/4/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/5/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/6/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/7/96					0	0	0.00	60.4	0	0	0					0.00				0.00	0.00	
2/8/96					0	0	0.00	60.8	0	0	0					0.00				0.00	0.00	
2/9/96					0	0	0.00	60.7	0	0	0					0.00				0.00	0.00	
2/10/96					0	0	0.00	60.6	0	0	0					0.00				0.00	0.00	
2/11/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
2/12/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
2/13/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
2/14/96					0	0	0.00	60.5	0	0	0					0.00				0.00	0.00	
2/15/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/16/96					0	0	0.00	60.2	0	0	0					0.00				0.00	0.00	
2/17/96					0	0	0.00	60.1	0	0	0					0.00				0.00	0.00	
2/18/96					24	187.7	372.30	59.9	9.1	2.08	1.8					0.00				0.00	0.00	
2/19/96					0	187.7	0.00	59.9	9.4	2.08	1.8					0.00				0.00	0.00	
2/20/96					23.5	91.9	178.49	59.8	8.4	1.32	0	13.5		1		151.89				0.00	0.00	
2/21/96		24	24		24	88.9	178.33	59.8	8.3	1.3	0	24				255.96				0.00	0.00	
2/22/96		8	23		24	100.6	378.05	59.9	9.3	2.1	1.62	24				255.96				0.00	0.00	
2/23/96		16	24		24	91.9	182.28	59.9	9	1.32	0	24				255.96				0.00	0.00	
2/24/96		24	24		24	187.7	372.30	59.9	9.4	2.08	1.52	24				255.96				0.00	0.00	
2/25/96		24	24		24	187.7	372.30	59.9	9.4	2.08	1.58	24				255.96				0.00	0.00	
2/26/96		24	24		24	187.7	372.30	59.8	9.4	2.08	1.58	24				255.96				0.00	0.00	
2/27/96		8	8		10	187.7	248.20	60	0	2.08	1.56	9				214.74				0.00	0.00	
2/28/96		10			16	88.9	117.55	60	7.7	1.3	0					190.01				0.00	0.00	
2/29/96		15.5	24		24	88.9	170.33	59.9	8.9	1.3	0					248.85				0.00	0.00	
3/1/96		21	21		24	165.2	327.67	60.1	9.6	1.92	1.34	0	24	0	0	284.16				0.00	0.00	
3/2/96		24	24	0	0	0	0.00	59.9	0.3	1.92	1.30	0	24	0	0	284.16				0.00	0.00	
3/3/96		24	24	0	0	0	0.00	59.9	0.3	1.9	1.32	0	24	0	0	284.16				0.00	0.00	
3/4/96		12	24	0	0	0	0.00	59.8	0.3	1.9	1.34	0	24	0	0	284.16				0.00	0.00	
3/5/96		8	24	0	0	0	0.00	60	8.2	1.36	0	0	24	0	0	284.16				0.00	0.00	
3/6/96		24	24	0	0	0	0.00	59.9	0.2	1.92	1.34	0	24	0	0	284.16				0.00	0.00	
3/7/96		8	10	0	0	18	165.2	245.75	59.9	0	1.92	1.34	0	10	14	229.24				0.00	0.00	
3/8/96		0	10	0	0	16	88.9	117.55	59.9	7.7	1.3	0	0	24	0	190.01				0.00	0.00	
3/9/96		12	24	0	0	24	91.9	182.28	59.9	8.7	1.32	0	0	24	0	190.01				0.00	0.00	
3/10/96		24	24	0	0	24	165.2	327.67	59.8	9.2	1.92	1.20	0	0	24	190.01				0.00	0.00	
3/11/96		16	8	0	0	24	165.2	327.67	59.9	8.7	1.92	1.26	0	0	24	190.01				0.00	0.00	
3/12/96		0	0	0	0	0	0.00	60	0	0	0	0	0	0	10	78.17				0.00	0.00	
3/13/96		0	0	0	0	0	0.00	60	0	0	0	0	0	0	0	0.00				0.00	0.00	

## 1996 Pumping

Date	Pumps				Pump Hours	Rate cfs	Volume Pumped acre-feet	Gauges		Flume		2nd Lift Pumps				Total Pumped acre-feet	Briscoe				Daily Total acre-foot
	#1	#2	#3	#4				Suction	Discharge	Up	Down	#1	#2	#3	#4		Total Pumped acre-feet				
																	#1	#2	#3	#4	
3/14/96	0	0	0	0	0	0.00	60.1	0	0	0	0	0	0	0	0.00	17.17	24	0	0	225.39	
3/15/96	0	0	0	0	0	0.00	60.3	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/16/96	0	0	0	0	0	0.00	60.3	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/17/96	0	0	0	0	0	0.00	60.2	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/18/96	0	0	0	0	0	0.00	60.1	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/19/96	0	0	0	0	0	0.00	60	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/20/96	0	0	0	0	0	0.00	60	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/21/96	0	0	0	0	0	0.00	60	0	0	0	0	0	0	0	0.00	0	24	0	0	225.39	
3/22/96	8	0	0	0	8	82.4	54.48	0	1.24	0	0	0	0	0	0.00	0	17	0	0	162.78	
3/23/96	16	0	0	0	16	84.0	111.87	59.9	8.2	1.26	0	0	0	0	0.00	0	24	0	0	279.87	
3/24/96	0	0	0	0	0	0.00	60	0	0	0	0	0	0	0	0.00	0	24	0	0	330.63	
3/25/96	0	0	0	0	0	0.00	60	0	0	0	0	0	0	0	0.00	0	24	0	0	330.63	
3/26/96	0	0	0	0	0	0.00	59.9	0	0	0	0	0	0	0	0.00	0	24	0	0	330.63	
3/27/96	0	0	0	0	0	0.00	59.9	0	0	0	0	0	0	0	0.00	0	24	0	0	330.63	
3/28/96	0	0	0	0	0	0.00	59.9	0	0	0	0	0	0	0	0.00	0	24	0	0	330.63	
3/29/96	0	0	10	0	10	88.9	73.47	60.1	0	1.3	0	0	0	0	0.00	0	24	0	0	330.63	
3/30/96	0	15.5	24	0	24	88.9	170.33	60	9.4	1.3	0	0	0	0	0.00	0	24	0	0	330.63	
3/31/96	0	24	24	0	24	182.1	301.19	59.9	9.4	2.04	1.64	0	14	0	165.78	0	24	0	0	401.73	
4/1/96	0	24	10	0	24	184.9	306.74	59.9	9	2.05	1.68	0	24	0	284.16	0	24	0	0	401.73	
4/2/96	0	24	8	0	24	93.7	171.97	60.2	8.3	1.28	0	14	0	0	255.87	0	24	0	0	401.73	
4/3/96	0	24	24	0	24	187.7	372.30	60.2	9.4	2.08	1.52	8	18	0	274.76	0	24	0	0	401.73	
4/4/96	0	18.5	18.5	0	24	187.7	372.30	60.2	0	2.08	1.58	0	24	0	284.16	0	24	0	0	401.73	
4/5/96	0	24	18	0	24	187.7	372.30	60.1	9.4	2.08	1.5	7	15.5	0	258.18	0	24	0	0	401.73	
4/6/96	0	24	8	0	24	91.9	162.28	60.1	8.3	1.32	0	24	0	0	255.96	0	24	0	0	401.73	
4/7/96	0	24	24	0	24	187.7	372.30	59.9	9.4	2.08	1.72	24	0	0	255.96	0	24	0	0	401.73	
4/8/96	0	24	18	0	24	187.7	372.30	59.9	9.4	2.08	1.74	24	0	0	255.96	0	24	0	0	401.73	
4/9/96	16	24	0	0	24	91.9	182.28	59.8	8.7	1.32	0	24	0	0	255.96	0	24	0	0	401.73	
4/10/96	24	18	0	0	24	165.2	327.67	59.8	9.2	1.52	1.44	19	0	2.5	222.43	0	24	0	0	401.73	
4/11/96	23	8	0	0	24	84.6	167.80	60	8.2	1.28	0	24	0	0	255.96	0	24	0	0	401.73	
4/12/96	24	24	0	0	24	182.7	322.71	60.3	9.3	1.9	1.4	24	0	0	255.96	0	24	0	0	401.73	
4/13/96	24	24	0	0	24	178.2	355.44	60.2	9.3	2.02	1.8	24	0	0	255.96	0	24	0	0	401.73	
4/14/96	8	24	0	0	24	165.2	327.67	60.1	8.5	1.82	1.56	24	0	0	255.96	0	24	0	0	401.73	
4/15/96	0	24	0	0	24	88.9	170.33	60.1	8.3	1.3	0	24	0	0	255.96	0	24	0	0	401.73	
4/16/96	8	24	0	0	24	88.9	170.33	60	8.3	1.3	0	9	0	0	214.74	0	24	0	0	401.73	
4/17/96	24	18	0	0	24	165.2	327.67	59.9	8.5	1.92	1.46	0	24	0	190.01	0	24	0	0	401.73	
4/18/96	8	24	0	0	24	170.9	339.08	59.8	8.7	1.60	1.54	0	24	0	190.01	0	24	0	0	401.73	
4/19/96	0	24	0	0	24	91.9	182.28	59.7	0.3	1.32	0	0	24	0	190.01	0	24	0	0	401.73	
4/20/96	0	24	0	0	24	91.9	182.28	59.7	8.36	1.32	0	0	24	0	190.01	0	24	0	0	401.73	
4/21/96	8	24	0	0	24	91.9	182.28	59.7	8.3	1.32	0	0	24	0	190.01	0	24	0	0	401.73	
4/22/96	24	10	0	0	24	168.1	333.42	59.6	9.2	1.94	1.44	0	10	14	155.61	0	24	0	0	401.73	
4/23/96	0	0	0	0	8	86.7	57.32	59.8	0	1.28	0	0	0	24	131.04	0	24	0	0	401.73	
4/24/96	8	0	0	0	8	84.6	55.93	59.8	0	1.26	0	0	0	24	131.04	0	24	0	0	401.73	
4/25/96	24	0	0	0	24	80.7	171.97	59.7	8.2	1.28	0	0	0	24	131.04	0	24	0	0	401.73	
4/26/96	24	0	0	0	24	176.6	350.28	59.9	8.3	2	1.46	0	0	0	24	131.04	0	24	0	0	401.73
4/27/96	20	0	0	0	20	84.6	138.83	60.2	7.2	1.26	0	0	0	24	131.04	0	24	0	0	401.73	
4/28/96	24	0	0	0	24	84.6	187.80	60.1	8.2	1.26	0	0	0	24	131.04	0	24	0	0	401.73	
4/29/96	22	0	0	0	22	84.6	153.82	60	8.2	1.26	0	0	0	16	8	170.35	0	24	0	0	401.73
4/30/96	24	8	0	0	24	84.6	167.80	60.1	8.2	1.26	0	0	0	24	190.01	0	24	0	0	401.73	
5/1/96	24	18	0	0	24	182.1	381.19	60.1	9.3	2.04	1.46	0	0	24	190.01	0	24	0	0	401.73	
5/2/96	24	8	0	0	24	187.7	372.30	60.2	8.3	2.09	1.48	0	0	24	190.01	0	24	0	0	401.73	
5/3/96	22	0	0	0	22	95.4	173.45	60.8	8.3	1.36	0	0	0	24	190.01	0	24	0	0	401.73	
5/4/96	24	0	0	0	24	88.9	178.33	60.4	8.2	1.3	0	0	0	24	190.01	0	24	0	0	401.73	
5/5/96	24	0	10	0	24	86.7	171.97	60.3	8.2	1.28	0	0	0	24	190.01	0	24	0	0	401.73	
5/6/96	16	0	0	0	24	157	311.40	60	9.1	1.66	1.36	0	0	24	190.01	0	24	0	0	401.73	
5/7/96	0	0	24	0	24	76.6	151.93	59.8	8.8	1.16	0	0	0	24	190.01	0	24	0	0	401.73	
5/8/96	0	16	24	0	24	74.1	146.08	59.8	8.8	1.16	0	0	0	24	190.01	0	24	0	0	401.73	
5/9/96	10	0	24	0	24	157	311.40	59.7	9.1	1.66	1.2	0	0	24	190.01	0	13.5	0	0	401.73	
5/10/96	0	0	24	0	24	76.6	151.93	59.8	8.2	1.18	0	0	0	24	190.01	0	0	10.5	0	401.73	
5/11/96	14	0	24	0	24	76.6	151.93	59.7	9.1	1.18	0	0	0	24	190.01	0	0	0	0	401.73	
5/12/96	24	0	24	0	24	165.2	327.67	59.8	9.1	1.92	1.28	0	0	24	190.01	0	0	0	0	401.73	
5/13/96	24	0	15	0	24	165.1	333.42	60.1	9.1	1.84	1.3	0	12	12	237.08	0	0	0	0	401.73	
5/14/96	24	0	8	0	24	86.7	171.97	60	8.2	1.28	0	0	0	24	190.01	0	0	0	0	401.73	
5/15/96	8	8	24	0	24	76.6	151.93	60	8.5	1.18	0	0	0	24	190.01	0	0	15.5	0	401.73	
5/16/96	0	24	24	0	24	190.8	378.05	59.8	9.3	2.1	1.68	0	24	0	284.16	0	12	0	0	401.73	
5/17/96	0	24	24	0	24	190.6	378.05	59.7	9.2	2.1	1.68	0	24	0	284.16	0	0	0	0	401.73	
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## 1996 Pumping

Date	Pumps				Pump Hours	Shannon		Gauges		2nd Lift				Total Pumped acre-feet	Briscoe				Daily Total acre-feet		
	#1	#2	#3	#4		Rate c/s	Volume Pumped acre-feet	Suction	Discharge	Flume		Pumps			#1	#2	#3	#4			
										Up	Down	#1	#2							#3	#4
5/2/96	0	24	24	0	24	198.4	389.55	59.9	9.3	2.14	1.72	0	24	0	5	311.46	0	0	24	212.14	16.4
5/2/96	0	24	24	0	24	198.4	389.55	60	9.3	2.14	1.72	0	24	0	5	316.92	0	0	24	218.77	16.6
5/2/96	0	24	24	0	24	199.3	395.31	60.1	9.3	2.16	1.74	0	24	0	5	311.46	0	11	24	319.03	16.9
5/2/96	0	24	24	0	24	199.3	395.31	60.1	9.3	2.16	1.74	0	24	0	5	311.46	0	24	24	437.53	16.6
5/3/96	0	24	24	0	24	199.3	395.31	60.2	9.3	2.16	1.74	0	24	0	5	311.46	0	24	24	437.53	16.5
5/3/96	0	24	24	0	24	199.3	395.31	60.2	9.3	2.16	1.74	0	24	0	5	311.46	0	24	24	437.53	16.5
5/3/96	0	24	24	0	24	202.2	401.06	60.4	9.3	2.18	1.76	0	24	0	5	311.46	0	24	24	437.53	16.5
6/1/96	0	24	24	0	24	199.3	395.31	60.3	9.3	2.16	1.76	0	24	0	5	311.46	0	24	24	437.53	16.7
6/2/96	0	23.5	23.5	0	24	199.3	395.31	60.4	9.3	2.16	1.76	0	24	0	5	311.46	0	21	20.5	369.74	17.2
6/3/96	0	24	24	0	24	199.3	395.31	60.4	9.3	2.16	1.76	0	24	0	5	311.46	0	24	24	459.63	17.7
6/4/96	0	24	24	0	24	199.3	395.31	60.4	9.3	2.16	1.76	0	24	0	5	311.46	0	24	24	459.63	17.7
6/5/96	0	24	12	0	24	202.2	401.06	60.7	9.3	2.18	1.74	0	24	0	5	311.46	0	24	24	459.63	17.5
6/6/96	0	24	14	0	24	198.4	389.55	60.6	9.7	2.14	1.68	0	24	0	5	311.46	0	24	8	306.42	17.6
6/7/96	0	24	24	0	24	198.4	389.55	60.5	9.3	2.14	1.64	0	24	0	5	311.46	0	24	0	234.23	18.1
6/8/96	0	22.5	22.5	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/9/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/10/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/11/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/12/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/13/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/14/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	0	234.23	18
6/15/96	0	21.5	21.5	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/16/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/17/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/18/96	0	24	24	0	24	199.3	395.31	60.5	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/19/96	0	24	24	0	24	202.2	401.06	60.8	9.3	2.18	1.7	0	24	0	5	311.46	0	24	16	353.02	17.7
6/20/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/21/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/22/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/23/96	0	24	13	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/24/96	0	24	13	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/25/96	0	24	13	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/26/96	0	24	13	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/27/96	0	16.5	16.5	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/28/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/29/96	0	13.5	13.5	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
6/30/96	0	15.5	7	0	22.5	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/1/96	0	24	24	0	24	202.2	401.06	61.1	9.3	2.18	1.7	0	24	0	5	311.46	0	24	16	353.02	17.7
7/2/96	0	10	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/3/96	0	10	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/4/96	0	14	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/5/96	0	24	10	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/6/96	0	24	14	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/7/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/8/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/9/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/10/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/11/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/12/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/13/96	0	16	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/14/96	0	10	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/15/96	0	16	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/16/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/17/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/18/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/19/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/20/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/21/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/22/96	0	24	24	0	24	199.3	395.31	60.8	9.3	2.16	1.68	0	24	0	5	311.46	0	24	16	353.02	17.7
7/23/96	0	24																			



Date	Pumps				Pump Hours	Shannon		Gauges		Flume		2nd Lift				Total Pumped acre-feet	Briscoe				Daily Total acre-feet		
	#1	#2	#3	#4		Rate cfs	Volume Pumped acre-feet	Suction	Discharge	Up	Down	Pumps		Total Pumped acre-feet	#1		#2	#3	Total Pumped acre-feet				
												#1	#2							#3		#4	
8/7/96	0	0	24	0	24	95.4	189.22	59.7	8.2	1.36	0	0	0	24	0	150.01	0	24	24	411.01	15.7	7	790.24
8/8/96	0	8	24	0	24	93.3	185.06	59.8	8.2	1.34	0	0	0	24	0	150.01	0	24	24	411.01	15.7	8	786.03
8/9/96	0	1	24	0	24	102.1	201.10	59.5	9.2	2.04	1.6	0	0	19.5	0	154.38	0	24	24	411.01	15.6	7.9	920.58
8/10/96	0	0	24	0	24	93.3	185.06	59.7	8.2	1.34	0	0	0	24	0	150.01	0	24	24	411.01	15.6	7.9	786.03
8/11/96	0	0	22	0	22	91.0	167.09	59.6	8.2	1.32	0	0	0	19.5	0	154.38	0	24	24	424.27	16	7.9	745.74
8/12/96	0	0	8	0	8	91.9	60.76	0	0	1.32	0	0	0	24	0	150.01	0	24	9	300.80	16.9	7	551.57
8/13/96	0	0	16	0	16	95.4	126.15	59.8	7.8	1.30	0	0	0	20	0	158.34	0	24	0	212.14	16.4	6.2	490.62
8/14/96	0	0	24	0	24	95.4	189.22	59.9	8.2	1.36	0	0	0	21	0	166.26	0	24	0	218.77	16.8	6.8	574.25
8/15/96	0	0	24	0	24	95.4	189.22	59.8	8.2	1.36	0	0	0	24	0	160.01	0	24	0	225.39	17.2	6.9	604.63
8/16/96	0	24	0	0	24	91.9	182.28	60	8.2	1.32	0	0	0	24	0	160.01	0	24	0	218.77	16.7	6.9	591.05
8/17/96	0	0	24	0	24	91.0	182.28	59.9	8.2	1.32	0	0	0	24	0	160.01	0	24	0	218.77	16.8	6.9	591.05
8/18/96	0	0	24	0	24	91.9	182.28	59.8	8.2	1.32	0	0	0	24	0	160.01	0	24	0	218.77	16.9	6.9	591.05
8/19/96	0	11	23	0	24	88.9	176.33	59.7	8.9	1.3	0	0	0	24	0	160.01	0	24	0	218.77	16.7	6.9	585.10
8/20/96	0	16	24	0	24	199.3	395.31	59.7	8.2	2.10	1.7	0	0	24	0	190.01	0	24	0	218.77	16.6	6.9	804.05
8/21/96	0	0	24	0	24	91.9	182.28	59.7	8.2	1.32	0	0	0	24	0	160.01	0	24	0	218.77	16.6	6.9	804.05
8/22/96	0	0	18	0	18	91.9	121.52	59.7	8.2	1.32	0	0	0	9.5	14.5	154.38	0	8	0	212.14	16.2	6.8	584.42
8/23/96	0	0	0	0	0	0	0.00	59.7	0	0	0	0	0	0	9	49.14	0	0	0	0.00	17.5	0	348.92
8/24/96	0	0	8	0	8	95.4	63.07	59.0	0	1.36	0	0	0	15	0	118.76	0	0	0	0.00	17	0	49.14
8/25/96	0	24	0	0	24	95.4	189.22	59.5	8.2	1.30	0	0	0	24	0	160.01	0	0	0	0.00	17.5	0	181.83
8/26/96	0	0	18	0	18	95.4	141.92	59.7	8.2	1.36	0	0	0	24	0	160.01	0	0	0	0.00	16.8	0	379.23
8/27/96	0	0	8	0	8	91.9	60.78	59.8	0	1.32	0	0	0	24	0	160.01	0	13.5	0	123.06	16.7	0	454.98
8/28/96	0	0	24	0	24	93.3	185.06	59.8	8.2	1.34	0	0	0	24	0	160.01	0	0	0	0.00	16.8	0	379.23
8/29/96	0	0	24	0	24	93.3	185.06	60.1	8.2	1.34	0	0	0	23	0	182.09	0	16	0	145.84	16.9	6.5	593.03
8/30/96	0	0	10	0	10	93.3	77.11	60.6	0	1.34	0	0	0	12	0	95.00	0	0	0	0.00	18.1	0	172.11
8/31/96	0	0	0	0	0	0	0.00	61.4	0	0	0	0	0	0	0	0.00	0	0	0	0.00	21.7	0	0.00
9/1/96	0	0	0	0	0	0	0.00	62.4	0	0	0	0	0	0	0	0.00	0	0	0	0.00	21.2	0	0.00
9/2/96	0	0	0	0	0	0	0.00	62.6	0	0	0	0	0	0	0	0.00	0	0	0	0.00	22.6	0	0.00
9/3/96	0	0	0	0	0	0	0.00	62.4	0	0	0	0	0	3	12	89.27	0	15.5	0	182.67	22.5	6	271.94
9/4/96	0	0	0	0	0	0	0.00	63.2	0	0	0	0	0	0	12	65.52	0	24	0	282.85	22.5	6	348.37
9/5/96	0	0	0	0	0	0	0.00	63.2	0	0	0	0	0	0	0	0.00	0	16	0	194.46	24.2	6.8	194.46
9/6/96	0	0	0	0	0	0	0.00	62.7	0	0	0	0	0	0	0	0.00	0	0	0	0.00	23.8	0	0.00
9/7/96	0	0	0	0	0	0	0.00	62.1	0	0	0	0	0	5	0	39.53	0	0	0	0.00	22.9	0	0.00
9/8/96	0	0	0	0	0	0	0.00	61.7	0	0	0	0	0	0	0	0.00	0	0	0	0.00	22.9	0	0.00
9/9/96	0	0	0	0	0	0	0.00	61.3	0	0	0	0	0	0	0	0.00	0	0	0	0.00	22.1	0	0.00
9/10/96	0	0	0	0	0	0	0.00	61.3	0	0	0	0	0	0	0	0.00	14.5	0	0	160.21	21.1	4.9	160.21
9/11/96	0	0	0	0	0	0	0.00	61.4	0	0	0	0	0	0	0	0.00	0	24	0	256.33	20.4	6.7	256.33
9/12/96	0	0	15	0	15	91.9	113.93	61.3	7.4	1.32	0	0	0	10	0	79.17	0	24	0	256.33	20.2	6.7	256.33
9/13/96	0	13	24	0	24	91.9	182.28	61.1	8.9	1.32	0	0	0	24	0	160.01	0	24	0	256.33	20.4	6.8	449.43
9/14/96	0	11	24	0	24	214.1	424.05	61	8.9	2.26	1.98	0	0	24	0	160.01	0	24	0	256.33	20.1	7.1	628.62
9/15/96	0	0	24	0	24	91.9	182.28	61	8.2	1.32	0	0	0	24	0	160.01	0	24	0	251.91	19.9	7.1	866.58
9/16/96	0	0	24	0	24	91.9	182.28	61	8.2	1.32	0	0	0	24	0	160.01	0	24	0	251.91	19.7	7.1	866.58
9/17/96	0	0	24	0	24	88.9	176.33	60.7	8.2	1.3	0	0	0	24	0	160.01	0	24	0	251.91	19.7	7.1	866.58
9/18/96	0	0	24	0	24	88.9	176.33	60.7	8.2	1.3	0	0	0	24	0	160.01	0	24	0	251.91	19.7	7.1	866.58
9/19/96	0	0	7.5	0	7.5	176.6	109.46	61	7.6	2	1.92	0	0	24	0	160.01	0	24	0	247.49	19.4	7.1	613.63
9/20/96	0	0	0	0	0	0	0.00	64.4	0	0	0	0	0	24	0	160.01	0	7.5	0	80.79	19	7.1	613.63
9/21/96	0	0	0	0	0	0	0.00	68.2	0	0	0	0	0	24	0	160.01	0	0	0	0.00	20.7	0	380.26
9/22/96	0	0	0	0	0	0	0.00	73.2	0	0	0	0	0	24	0	160.01	0	0	0	0.00	23.5	0	190.01
9/23/96	0	0	0	0	0	0	0.00	72.5	0	0	0	0	0	24	0	160.01	0	0	0	0.00	23.5	0	190.01
9/24/96	0	0	0	0	0	0	0.00	72.5	0	0	0	0	0	14	10	165.44	0	13	0	201.09	38.9	5.5	366.53
9/25/96	0	0	0	0	0	0	0.00	69.3	0	0	0	0	0	0	24	131.04	0	24	0	357.59	36.1	7.3	459.02
9/26/96	0	0	0	0	0	41	0.00	67.5	7	0.8	0.8	0	0	0	24	131.04	0	24	0	338.09	32.8	7.2	469.13
9/27/96	0	0	0	0	0	0	0.00	66	0	0	0	0	0	0	24	131.04	0	24	0	327.04	30.4	7.1	458.08
9/28/96	0	0	0	0	0	0	0.00	65	0	0	0	0	0	0	24	131.04	0	24	0	315.99	28.1	7.1	447.03
9/29/96	0	0	0	0	0	0	0.00	64.0	0	0	0	0	0	0	24	131.04	0	24	0	309.36	27.1	7	440.40
9/30/96	0	0	0	0	0	0	0.00	64.3	0	0	0	0	0	0	24	131.04	0	24	0	302.74	26.1	7	432.78
10/1/96	0	17	0	0	17	97.7	96.89	64.5	6.8	1.38	0	0	0	0	24	131.04	0	24	0	298.32	25.7	7	526.25
10/2/96	0	9	13	0	22	97.7	177.64	63.9	8.2	1.38	0	0	0	0	24	131.04	0	24	0	298.32	25.9	7.2	606.99
10/3/96	0	19	0	0	19	102.2	160.48	63.3	7.5	1.42													



## 1996 Pumping

Date	Pumps				Pump Hours	Shannon		Gauges		Flume		2nd Lift				Total Pumped acre-feet	Eniscoe				Daily Total acre-feet						
	#1	#2	#3	#4		Rate cfs	Volume Pumped acre-feet	Suction		Discharge		Up	Down	Pumps			#1	#2	#3	#4		Total Pumped acre-feet	Pumps		Total Pumped acre-feet	Gauges	
								Suction	Discharge	Suction	Discharge			#1	#2								#1	#2		#1	#2
10/19/96	0	24	0	0	24	88.9	178.33	60.5	8.3	1.3	0	0	0	0	0	0	0	24	131.04	0	0	0	0	18.8	0	307.37	
10/20/96	0	24	0	0	24	88.9	178.33	60.6	8.3	1.3	0	0	0	0	0	0	0	24	131.04	0	0	0	0	18.9	0	307.37	
10/21/96	0	16	0	0	16	88.8	117.55	60.5	8.3	1.3	0	0	0	0	0	0	0	12	65.52	0	0	12.5	125.45	18.9	5.5	374.04	
10/22/96	0	0	0	0	0	0	0.00	60.7	0	0	0	0	0	0	0	0	0	0	0.00	0	0	24	240.86	18.6	6.3	306.38	
10/23/96	0	0	0	0	0	0	0.00	60.7	0	0	0	0	0	0	0	0	0	0	0.00	0	12.5	11.5	240.86	18.7	6.3	240.66	
10/24/96	0	0	0	0	0	0	0.00	60.7	0	0	0	0	0	0	0	0	0	0	0.00	0	4	0	40.14	18.7	6.6	40.14	
10/25/96	0	0	0	0	0	0	0.00	60.5	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	164.93	19	6.6	164.93	
10/26/96	0	0	0	0	0	0	0.00	61.3	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	19.2	0	0.00	
10/27/96	0	0	0	0	0	0	0.00	60.8	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	19.1	0	0.00	
10/28/96	0	0	0	0	0	0	0.00	60.5	0	0	0	0	0	0	0	0	0	0	0.00	0	0	16	170.89	20.2	5.8	170.89	
10/29/96	0	0	0	0	0	0	0.00	60.5	0	0	0	0	0	0	0	0	0	0	0.00	0	8	7.5	182.69	19.6	0	182.69	
10/30/96	0	0	0	0	0	0	0.00	60.5	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	240.86	18.7	6.5	240.86	
10/31/96	0	0	0	0	0	0	0.00	61.4	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	234.23	18.4	6.5	234.23	
11/1/96	0	0	0	0	0	0	0.00	60.3	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	234.23	18.3	6.5	234.23	
11/2/96	0	0	0	0	0	0	0.00	60.3	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	247.49	19.3	6.5	247.49	
11/3/96	0	8	0	0	8	93.3	61.69	60.6	0	1.34	0	0	0	0	0	0	0	0	0.00	0	24	0	234.23	18	6.5	234.23	
11/4/96	0	24	0	0	24	87.7	183.79	60.7	8.3	1.38	0	0	0	0	0	0	0	0	31.67	0	24	0	234.23	18.2	6.5	327.59	
11/5/96	0	8	0	0	8	97.7	64.60	61.7	0	1.38	0	0	0	0	0	0	0	0	47.50	0	23	0	234.23	18.3	6.5	475.52	
11/6/96	0	0	0	0	0	0	0.00	62	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	230.83	18.5	6.5	342.92	
11/7/96	0	0	0	0	0	0	0.00	61.4	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	250.33	20.1	6.6	250.33	
11/8/96	0	0	0	0	0	0	0.00	61.1	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	265.17	21	6.6	265.17	
11/9/96	0	0	0	0	0	0	0.00	61	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	256.33	20.2	6.6	256.33	
11/10/96	0	0	0	0	0	0	0.00	61.2	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	251.91	19.6	6.5	251.91	
11/11/96	0	0	0	0	0	0	0.00	61.5	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	247.49	19.4	6.5	247.49	
11/12/96	0	0	0	0	0	0	0.00	61.7	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	251.91	18.6	6.6	251.91	
11/13/96	0	0	0	0	0	0	0.00	62.4	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	256.33	20.4	6.6	256.33	
11/14/96	0	0	0	0	0	0	0.00	62.4	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	258.54	20.7	6.6	258.54	
11/15/96	0	0	0	0	0	0	0.00	62.8	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	276.43	22.1	6.7	276.43	
11/16/96	0	0	0	0	0	0	0.00	62.9	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	287.27	23	6.8	287.27	
11/17/96	0	0	0	0	0	0	0.00	62.4	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	287.27	23.1	6.8	287.27	
11/18/96	0	0	0	0	0	0	0.00	61.2	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	282.85	22.9	6.8	282.85	
11/19/96	0	0	0	0	0	0	0.00	61.3	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	313.78	27.6	6.7	313.78	
11/20/96	0	0	0	0	0	0	0.00	61.1	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	256.33	20.4	6.7	256.33	
11/21/96	0	0	0	0	0	0	0.00	61	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	251.91	19.7	6.6	251.91	
11/22/96	0	0	0	0	0	0	0.00	60.8	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	247.49	19.4	6.6	247.49	
11/23/96	0	0	0	0	0	0	0.00	60.7	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	247.49	19.1	6.6	247.49	
11/24/96	0	0	0	0	0	0	0.00	61.8	0	0	0	0	0	0	0	0	0	0	0.00	0	12	0	123.75	19	6.6	123.75	
11/25/96	0	0	0	0	0	0	0.00	62.2	0	0	0	0	0	0	0	0	0	0	0.00	0	16	0	170.89	20.1	6.6	170.89	
11/26/96	0	0	0	0	0	0	0.00	62.6	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	258.54	20.9	6.6	258.54	
11/27/96	0	0	0	0	0	0	0.00	62.1	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	278.43	22	6.7	278.43	
11/28/96	0	0	0	0	0	0	0.00	62	0	0	0	0	0	0	0	0	0	0	0.00	0	12	12	278.43	22.3	6.8	278.43	
11/29/96	0	0	0	0	0	0	0.00	62.5	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	274.01	21.6	6.5	269.84	
11/30/96	0	0	0	0	0	0	0.00	63.3	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	278.43	22.2	6.6	278.43	
12/1/96	0	0	0	0	0	0	0.00	63.2	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	278.43	22.3	6.5	278.43	
12/2/96	0	0	0	0	0	0	0.00	63.8	0	0	0	0	0	0	0	0	0	24	0	190.01	0	0	282.85	22.7	6.5	472.86	
12/3/96	0	0	0	0	0	0	0.00	64.7	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	269.48	23.7	6.5	269.48	
12/4/96	0	0	0	0	0	0	0.00	66	0	0	0	0	0	0	0	0	0	0	0.00	0	8	0	97.97	24.9	0	97.97	
12/5/96	0	0	0	0	0	0	0.00	66.5	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0.00	
12/6/96	0	0	0	0	0	0	0.00	66.7	0	0	0	0	0	0	0	0	0	0	0.00	0	16	0	212.14	28.6	6	212.14	
12/7/96	0	0	0	0	0	0	0.00	66.3	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	320.41	29.1	6.7	320.41	
12/8/96	0	0	0	0	0	0	0.00	65.5	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	320.41	29.2	6.6	320.41	
12/9/96	0	0	0	0	0	0	0.00	64.7	0	0	0	0	0	0	0	0	0	4	0	31.67	0	24	318.20	28.5	6.6	349.87	
12/10/96	0	0	0	0	0	0	0.00	64.2	0	0	0	0	0	0	0	0	0	0	0.00	0	24	0	309.36	27.3	6.6	309.36	
12/11/96	0	0	0	0	0	0	0.00	64																			

## 1998 Pumping

Date	Shannon										2nd Lin										Bnscoe										Daily Total acre-foot
	Pumps				Pump Holes	Rate ft <sup>3</sup>	Volume Pumped acre-feet	Gauges		Flume		Pumps				Total Pumped acre-feet	Pumps				Total Pumped acre-feet	Gauges									
	#1	#2	#3	#4				Suction	Discharge	Up	Down	#1	#2	#3	#4		#1	#2	#3	#4		Suction	Discharge								
12/31/98	0	0	0	0	0	0	0.00																								
Total:	852.5	3314	2931	0			54,992.35					62.7	0																		
					</																										

## 1997 Pumping

Date	Shannon				2nd Lift				Briscoe			
	Pumps				Pumps				Pumps			
	#1	#2	#3	#4	Up	Down	Pumping Rate	Amount acre-feet	#1	#2	#3	Amount acre-feet
1/1/97	0	0	0	0	0	0	0	0	0	0	0	0
1/2/97	0	0	0	0	0	0	0	0	0	0	0	0
1/3/97	0	0	0	0	0	0	0	0	0	0	0	0
1/4/97	0	0	0	0	0	0	0	0	0	0	0	0
1/5/97	0	0	0	0	0	0	0	0	0	0	0	0
1/6/97	0	0	0	0	0	0	0	0	0	0	0	0
1/7/97	0	0	0	0	0	0	0	0	0	0	0	0
1/8/97	0	0	0	0	0	0	0	0	0	0	0	0
1/9/97	0	0	0	0	0	0	0	0	0	0	0	0
1/10/97	0	0	0	0	0	0	0	0	0	0	0	0
1/11/97	0	0	0	0	0	0	0	0	0	0	0	0
1/12/97	0	0	0	0	0	0	0	0	0	0	0	0
1/13/97	0	0	0	0	0	0	0	0	0	0	0	0
1/14/97	0	0	0	0	0	0	0	0	0	0	0	0
1/15/97	0	0	0	0	0	0	0	0	0	0	0	0
1/16/97	0	0	0	0	0	0	0	0	0	0	0	0
1/17/97	0	0	0	0	0	0	0	0	0	0	0	0
1/18/97	0	0	0	0	0	0	0	0	0	0	0	0
1/19/97	0	0	0	0	0	0	0	0	0	0	0	0
1/20/97	0	0	0	0	0	0	0	0	0	0	0	0
1/21/97	0	0	0	0	0	0	0	0	0	0	0	0
1/22/97	0	0	0	0	0	0	0	0	0	0	0	0
1/23/97	0	0	0	0	0	0	0	0	0	0	0	0
1/24/97	0	0	0	0	0	0	0	0	0	0	0	0
1/25/97	0	0	0	0	0	0	0	0	0	0	0	0
1/26/97	0	0	0	0	0	0	0	0	0	0	0	0
1/27/97	0	0	0	0	0	0	0	0	0	0	0	0
1/28/97	0	0	0	0	0	0	0	0	0	0	0	0
1/29/97	0	0	0	0	0	0	0	0	0	0	0	0
1/30/97	0	0	0	0	0	0	0	0	0	0	0	0
1/31/97	0	0	0	0	0	0	0	0	0	0	0	0
2/1/97	0	0	0	0	0	0	0	0	0	0	0	0
2/2/97	0	0	0	0	0	0	0	0	0	0	0	0
2/3/97	0	0	0	0	0	0	0	0	0	0	0	0
2/4/97	0	0	0	0	0	0	0	0	0	0	0	0
2/5/97	0	0	0	0	0	0	0	0	0	0	0	0
2/6/97	0	0	0	0	0	0	0	0	0	0	0	0
2/7/97	0	0	0	0	0	0	0	0	0	0	0	0
2/8/97	0	0	0	0	0	0	0	0	0	0	0	0
2/9/97	0	0	0	0	0	0	0	0	0	0	0	0
2/10/97	0	0	0	0	0	0	0	0	0	0	0	0
2/11/97	0	0	0	0	0	0	0	0	0	0	0	0
2/12/97	0	0	0	0	0	0	0	0	0	0	0	0
2/13/97	0	0	0	0	1.32	1.32	91.9	0	0	0	0	0
2/14/97	0	0	0	0	0	0	0	0	0	0	0	0
2/15/97	0	0	0	0	0	0	0	0	0	0	0	0
2/16/97	0	0	0	0	0	0	0	0	0	0	0	0
2/17/97	0	0	0	0	0	0	0	0	0	0	0	0
2/18/97	0	0	0	0	0	0	0	0	0	0	0	0
2/19/97	0	0	0	0	0	0	0	0	0	0	0	0
2/20/97	0	0	0	0	0	0	0	0	0	0	0	0
2/21/97	0	0	0	0	0	0	0	0	0	0	0	0
2/22/97	0	0	0	0	0	0	0	0	0	0	0	0
2/23/97	0	0	0	0	0	0	0	0	0	0	0	0
2/24/97	0	0	0	0	0	0	0	0	0	0	0	0
2/25/97	0	0	0	0	0	0	0	0	0	0	0	0
2/26/97	0	0	0	0	0	0	0	0	0	0	0	0
2/27/97	0	0	0	0	0	0	0	0	0	0	0	0
2/28/97	0	0	0	0	0	0	0	0	0	0	0	0
3/1/97	0	0	0	0	0	0	0	0	0	0	0	0
3/2/97	0	0	0	0	0	0	0	0	0	0	0	0
3/3/97	0	0	0	0	0	0	0	0	0	0	0	0
3/4/97	0	0	0	0	0	0	0	0	0	0	0	0
3/5/97	0	0	0	0	0	0	0	0	0	0	0	0
3/6/97	0	0	0	0	0	0	0	0	0	0	0	0
3/7/97	0	0	0	0	0	0	0	0	0	0	0	0
3/8/97	0	0	0	0	0	0	0	0	0	0	0	0
3/9/97	0	0	0	0	0	0	0	0	0	0	0	0

Date	Shannon					2nd Lift					Briscoe				
	Pumps				Pumping Rate	Pumps				Amount acre-feet	Pumps			Amount	
	#1	#2	#3	#4		#1	#2	#3	#4		#1	#2	#3	acre-feet	Gauges
					Up	Down				acre-feet					Suction Discharge
3/10/97	0	0	0	0	0	0	0	0	0	0	0	24	0	419.85239	48.8 7.1
3/11/97	0	0	0	0	0	0	0	0	0	39.585	0	24	0	419.85239	48.5 7.2
3/12/97	0	0	0	0	0	0	0	0	0	0	0	9.5	0	169.69034	49.8 0
3/13/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53.8 0
3/14/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53.8 0
3/15/97	0	0	0	0	0	0	0	0	0	0	0	9.5	0	174.9385	55.5 0
3/16/97	0	0	0	0	0	0	0	0	0	0	0	24	0	441.94988	55.4 7.4
3/17/97	0	0	0	0	0	0	0	0	0	0	0	24	0	441.94988	54.2 7.4
3/18/97	0	0	0	0	0	0	0	0	0	0	0	6.5	0	110.09476	54.1 0
3/19/97	0	0	0	0	4	4	425	0	0	0	0	0	0	0	50.2 0
3/20/97	0	0	0	0	0.52	0.52	20.7	0	0	0	0	0	0	0	45.5 0
3/21/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41.1 0
3/22/97	0	0	0	0	0	0	0	4	0	31.668	0	0	0	0	39 0
3/23/97	0	0	0	0	0	0	0	4	0	31.668	0	0	12	184.51408	38.2 0
3/24/97	0	0	0	0	0	0	0	0	0	0	0	0	24	366.8184	37.8 6.9
3/25/97	0	0	0	0	0	0	0	0	0	0	0	0	20	307.52346	38 6.9
3/26/97	0	0	0	0	0	0	0	4	0	31.668	0	0	0	0	38.6 0
3/27/97	0	0	0	0	0	0	0	4	0	31.668	0	0	16.5	252.18765	37.9 6.5
3/28/97	0	0	0	0	0	0	0	0	0	0	0	0	24	362.3989	37 6.9
3/29/97	0	0	0	0	0	0	0	0	0	0	0	0	24	360.18915	36.6 7
3/30/97	0	0	0	0	0	0	0	0	0	0	0	0	24	357.97941	36.2 7
3/31/97	0	0	0	0	0	0	0	0	0	0	0	0	24	355.76566	35.7 7
4/1/97	0	0	0	0	0	0	0	4	0	31.668	0	0	24	351.35016	34.9 7
4/2/97	0	0	0	0	0	0	0	0	0	0	0	0	24	349.14041	34.1 7
4/3/97	0	0	0	0	0	0	0	4	0	31.668	0	0	7.5	106.34419	33.4 0
4/4/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36.7 0
4/5/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39.1 0
4/6/97	0	0	0	0	0.3	0	8.6	0	4	31.668	0	0	0	0	40.6 0
4/7/97	0	0	0	0	0	0	0	4	0	31.668	0	0	0	0	48.2 0
4/8/97	0	0	0	0	0	0	0	4	0	31.668	0	0	0	0	49.8 0
4/9/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52.2 0
4/10/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52.5 6.3
4/11/97	0	0	0	0	0	0	0	0	0	0	0	3	0	54.091298	51.4 0
4/12/97	0	0	0	0	0	0	0	0	0	0	0	11	0	156.48355	49.9 0
4/13/97	0	0	0	0	0	0	0	0	0	0	0	24	0	411.01339	47.1 7.3
4/14/97	0	0	0	0	0	0	0	0	0	0	0	24	0	397.75489	44 4.7
4/15/97	0	0	0	0	0	0	0	0	0	0	0	24	0	386.70615	41.6 7.4
4/16/97	0	0	0	0	0	0	0	0	0	0	0	24	0	375.6574	39.6 7.2
4/17/97	0	0	0	0	0	0	0	0	0	0	0	24	0	369.02815	38 7.3
4/18/97	0	0	0	0	0	0	0	4	0	31.668	0	24	0	362.3989	37 7.3
4/19/97	0	0	0	0	0	0	0	0	0	0	0	24	0	357.97941	36.2 7.3
4/20/97	0	0	0	0	0	0	0	4	0	31.668	0	24	0	355.76566	35.5 7.3
4/21/97	0	0	0	0	0	0	0	4	0	31.668	0	24	0	349.14041	34.4 7.3
4/22/97	0	0	0	0	0	0	0	4	0	31.668	0	24	0	340.30141	33.4 7.3
4/23/97	0	0	0	0	0	0	0	0	0	0	0	24	0	340.30141	33 7.2
4/24/97	0	0	0	0	0	0	0	4	0	31.668	0	24	0	338.09166	32.7 0
4/25/97	0	0	0	0	0	0	0	0	0	0	0	10.5	0	146.94834	32.2 0
4/26/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36.4 0
4/27/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.6 0
4/28/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.8 0
4/29/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.7 0
4/30/97	0	0	0	0	0	0	0	4	0	31.668	0	0	0	0	46.6 0
5/1/97	0	0	0	0	0	0	0	5	0	39.585	0	0	0	0	44.9 0
5/2/97	0	0	0	0	0	0	0	4	0	31.668	0	15	0	238.92916	40.6 6.5
5/3/97	0	0	0	0	0	0	0	0	0	0	0	24	0	369.02815	38.3 7.4
5/4/97	0	0	0	0	0	0	0	0	0	0	0	24	0	362.3989	37.2 7.5
5/5/97	0	0	0	0	0	0	0	0	0	0	0	24	0	362.3989	37.2 7.5
5/6/97	0	0	0	0	0	0	0	0	0	0	0	24	0	360.18915	36.8 7.5
5/7/97	0	0	0	0	0	0	0	0	0	0	0	24	0	360.18915	36.7 7.3
5/8/97	0	0	0	0	0	0	0	0	0	0	0	24	0	360.18915	36.7 7.3
5/9/97	0	0	0	0	0	0	0	0	0	0	0	19.5	0	290.85827	36.1 7.3
5/10/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35.4 0
5/11/97	0	0	0	0	0	0	0	0	0	0	0	16.5	0	240.03403	34.1 6.8
5/12/97	0	0	0	0	0	0	0	0	4	21.84	0	24	0	340.30141	33.4 7.4
5/13/97	0	0	0	0	0	0	0	0	0	0	0	24	0	344.72091	33.8 7.5
5/14/97	0	0	0	0	0	0	0	0	0	0	0	24	0	351.35016	34.8 7.5
5/15/97	0	0	0	0	0	0	0	0	0	0	0	24	0	366.8184	37.7 7.6
5/16/97	0	0	0	0	0	0	0	4	0	21.84	0	24	0	380.0769	40.4 7.7



## 1997 Pumping

Date	Shannon					Pumping Rate	Amount acre-feet	2nd Lift				Amount acre-feet	Briscoe			Gauges		
	Pumps				Pumps			Amount acre-feet	Pumps	Amount acre-feet	Suction		Discharge					
	#1	#2	#3	#4										#1	#2	#3	#4	
5/17/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	380 0769	40.2	7.7	
5/18/97	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	226 49931	37.4	7.6
5/19/97	0	0	0	0	0	0	0	0	0	0	0	31 668	0	15	0	220 45931	37	6.8
5/20/97	0	0	0	0	0	0	0	0	0	0	0	0	0	13.5	0	208 82132	38.5	7.7
5/21/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0
5/22/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36.8	0
5/23/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.3	0
5/24/97	0	0	0	0	2.76	2.76	294	0	0	0	0	0	0	0	0	0	35	0
5/25/97	0	0	0	0	5.08	5.08	425	0	15.5	0	18	0	126 672	0	0	0	35.4	0
5/26/97	0	0	0	0	2.4	2.4	235.6	0	24	0	8.5	0	232 802	0	0	0	35.6	0
5/27/97	0	0	0	0	0.1	0	0	0	0	0	0	0	255.93	0	0	0	36.6	0
5/28/97	0	0	0	0	0	0	0	0	15.5	0	0	0	255.93	0	0	0	37.6	0
5/29/97	0	0	0	0	0	0	0	0	0	0	0	165 3075	0	0	0	0	35.0	7
5/30/97	0	0	0	0	0	0	0	0	0	0	4	0	31 668	18	0	0	34.4	7.5
5/31/97	0	0	0	0	0	0	0	0	0	0	4	0	31 668	0	0	0	34.1	8.6
6/1/97	0	0	0	0	0	0	0	0	0	0	4	0	31 668	24	0	14	232 76027	34.7
6/2/97	0	0	0	0	0	0	0	0	0	0	4	0	31 668	0	0	24	351.35016	34.4
6/3/97	0	0	0	0	0	0	0	0	0	0	6	0	47 502	0	14	10	344 72091	33.0
6/4/97	0	8	0	0	1.5	0.88	111.6	73 785124	0	0	5	0	39 585	0	24	0	333 67216	31.7
6/5/97	0	24	0	0	1.5	0.88	111.6	221.35537	0	0	4	11	91 728	0	24	0	331 46241	31.2
6/6/97	0	22.5	0	0	1.5	1.02	111.6	207 52066	0	0	0	24	131 04	16	8	0	329 25266	30.8
6/7/97	0	11	0	0	1.52	1.02	113.9	103 54545	0	0	0	24	131 04	24	0	0	329 25266	30.5
6/8/97	0	13	0	0	1.52	1.02	113.9	122 3719	0	0	0	0	24	0	0	8.5	226 30121	30.5
6/9/97	0	13.5	0	0	1.58	1.16	121.2	135 22314	0	0	15	0	167 895	0	0	24	331 46241	31
6/10/97	0	8	0	0	1.46	0.68	109.7	72 526926	0	0	24	0	190 008	0	0	24	335 88191	32.4
6/11/97	0	24	0	0	1.48	0.68	109.7	217 58078	0	0	24	0	190 008	0	0	24	340 30141	33.3
6/12/97	0	24	0	0	1.78	1.52	148.4	260 38017	0	0	24	0	190 008	0	0	24	331 46241	31
6/13/97	0	24	0	0	1.88	1.68	159.0	317 15702	0	0	24	0	190 008	0	0	24	371 2379	38.6
6/14/97	0	24	0	0	1.74	1.5	141.1	279 86777	0	0	24	0	190 008	0	0	24	388 9159	42
6/15/97	0	24	0	0	1.72	1.48	138.2	274 1157	0	0	24	0	190 008	0	0	24	388 70615	41.8
6/16/97	0	24	0	0	1.7	1.4	136.1	269 95041	0	0	24	0	190 008	0	10	371 2379	38.5	
6/17/97	0	24	0	0	1.62	1.36	128	249 01736	0	0	24	0	190 008	24	0	0	357 97941	36.4
6/18/97	0	24	0	0	1.6	1.32	123.6	245 15702	0	0	24	0	190 008	24	0	0	353 55991	35.3
6/19/97	0	12	0	0	1.6	1.26	123.6	122 57851	0	0	24	0	190 008	24	0	0	344 72091	33.9
6/20/97	0	10.5	0	0	1.58	1.26	121.2	105 17355	0	0	24	0	190 008	24	0	0	340 30141	33.2
6/21/97	0	14	0	0	1.58	1.2	121.2	140 2314	0	0	24	0	190 008	24	0	0	340 30141	33.1
6/22/97	0	0	0	0	0	0	0	0	0	22.5	122 85	20	0	0	0	0	283 58451	33.3
6/23/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34.6
6/24/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35.5
6/25/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35.5
6/26/97	0	16	0	0	1.5	0.88	111.6	147 57025	0	0	24	0	190 008	0	8	0	117 833	35.1
6/27/97	0	8	0	0	1.58	1.02	121.2	80 132331	0	0	24	0	190 008	0	24	0	344 72091	33.6
6/28/97	0	8	0	0	1.52	0.78	113.9	75 305785	0	0	24	0	190 008	7.5	16.5	340 30141	33.1	
6/29/97	0	24	0	0	1.52	0.78	113.9	225 91736	0	0	24	0	190 008	0	0	24	340 30141	33.4
6/30/97	0	23.5	0	0	1.52	0.72	113.9	221 21074	0	0	24	0	190 008	0	0	24	335 88191	32.1
7/1/97	0	24	0	0	1.6	1.06	123.6	245 15702	0	0	24	0	190 008	0	12	335 88191	32.4	
7/2/97	0	17	0	0	1.62	1.2	126	177 02479	0	0	24	0	190 008	0	24	0	344 72091	33.8
7/3/97	0	15.5	0	0	1.62	1.06	126	161 40436	0	0	24	0	190 008	0	24	0	357 97941	36
7/4/97	0	23	0	0	1.6	0.92	123.6	234 94215	0	0	24	0	190 008	0	24	0	360 18915	36.6
7/5/97	0	24	0	0	1.56	0	118.8	235 63638	0	0	24	0	190 008	0	24	0	353 55991	35.3
7/6/97	0	24	0	0	1.5	0.82	111.6	221 35537	0	0	24	0	190 008	18	8	0	340 30141	33.3
7/7/97	0	24	0	0	1.5	0.72	111.6	221 35537	0	0	24	0	190 008	8	16	0	331 46241	31.2
7/8/97	0	24	0	0	1.5	0.68	111.6	221 35537	0	0	24	0	190 008	0	24	0	322 62341	29.8
7/9/97	0	21	0	0	1.48	0.65	109.7	190 38843	0	0	24	0	190 008	0	24	0	318 20392	28.9
7/10/97	0	22	0	0	1.46	0.44	106.8	194 18182	0	0	24	0	190 008	0	24	0	318 20392	28.5
7/11/97	0	24	0	0	1.48	0.5	106.8	211 83471	0	0	24	0	190 008	0	7.5	4	268 02419	27.7
7/12/97	0	24	0	0	1.48	0.5	106.8	211 83471	0	0	15	9	167 895	24	0	0	369 36492	27.1
7/13/97	0	24	0	0	1.5	0	111.0	221 35537	0	0	0	24	131.04	24	0	12	480 73275	26.6
7/14/97	0	24	0	0	1.5	0.6	111.6	221 35537	0	0	0	24	131.04	24	0	24	627 56883	27.9
7/15/97	0	24	0	0	1.46	0.62	106.8	211 83471	0	0	18	6	175 266	24	0	24	636 40783	28.7
7/16/97	0	24	0	0	1.46	0.58	106.8	211 83471	0	0	14	10	185 436	24	0	24	636 40783	28.7
7/17/97	0	24	0	0	1.42	0.5	102.2	202 71074	0	0	10	14	155 61	24	0	24	627 56883	27.7
7/18/97	0	24	0	0	1.44	0.5	104.5	207 27273	0	0	10	14	155 61	24	0	12	460 73275	26.7
7/19/97	0	24	12	0	1.44	0.5	104.5	207 27273	0	0	24	0	190 008	24	0	0	302 73567	26.2
7/20/97	0	24	24	0	2.92	2.78	322	638 67769	0	0	24	0	190 008	24	0	0	302 73567	26.1
7/21/97	0	24	24	0	2.98	2.68	332	658 5124	15.5	0	8.5	0	232 802	24	0	0	302 73567	26.2
7/22/97	0	24	24	0	2.96	2.68	329	652 56198	24	0	0	0	255 66	24	0	0	302 73567	26.1
7/23/97	0	24	24	0	2.86	2.76	311	616 8595	24	0	0	6	268 72	24	0	0	302 73567	26.2



Date	Shannon								2nd Lift								Biscos													
	Pumps				Flume				Pumping Amount				Pumps				Amount				Pumps				Amount				Gauges	
	#1	#2	#3	#4	Up	Down	Rate	acre-feet	#1	#2	#3	#4	acre-feet	#1	#2	#3	acre-feet	#1	#2	#3	acre-feet	Suction	Discharge							
7/24/97	0	24	24	0	2.86	2.76	311	616.8595	24	0	0	0	16	343.32	24	0	0	302.73567	26	7.3										
7/25/97	0	24	24	0	2.66	2.74	311	616.8595	24	0	0	0	15	337.86	24	0	0	298.31617	25.9	7.3										
7/26/97	0	24	24	0	2.8	2.68	301	597.02470	24	0	0	0	15	337.86	24	0	0	298.31617	25.7	7.3										
7/27/97	0	24	24	0	2.78	2.62	294	583.1405	24	0	0	0	14	332.4	24	0	0	266.10642	25.4	7.3										
7/28/97	0	24	24	0	2.72	2.6	287	569.2502	24	0	0	0	12	321.48	24	0	0	266.10642	25	7.3										
7/29/97	0	11	24	2.7	2.56	284	563.30578	24	30.6	0	0	0	8	289.64	24	0	0	293.89607	24.9	7.2										
7/30/97	0	0	24	0	1.34	0	93.3	185.05785	9	0	15	0	214.74	24	0	0	9	404.10792	24.7	7.2										
7/31/97	0	0	24	0	1.32	0	91.9	182.28099	0	0	24	0	190.008	24	0	0	24	578.95435	23.9	8.8										
8/1/97	0	0	24	0	1.32	0	91.0	182.28099	0	0	24	0	190.008	24	0	0	24	574.53485	23.1	8.9										
8/2/97	0	0	24	0	1.32	0	91.0	182.28099	0	0	24	0	190.008	24	0	0	24	565.69585	22.6	8.9										
8/3/97	0	0	24	0	1.31	0	88.9	176.33058	0	0	7.5	18	157.6575	24	0	0	24	565.69585	22.5	8.9										
8/4/97	0	0	24	0	1.3	0	88.9	176.33058	0	0	0	24	131.04	24	0	0	24	565.69585	22.7	8.9										
8/5/97	0	0	24	0	1.32	0	91.0	182.28099	0	0	0	24	131.04	24	0	0	24	565.69585	22.9	8.9										
8/6/97	0	0	24	0	1.3	0	88.9	176.33058	0	0	0	24	131.04	24	0	0	24	565.69585	22.7	8.9										
8/7/97	0	0	24	1.3	0	88.9	176.33058	0	0	0	24	131.04	24	0	0	0	24	565.69585	22.5	8.9										
8/8/97	0	0	23.5	0	1.32	0	91.9	178.48347	0	0	0	0	24	131.04	24	0	0	24	556.85685	22.1	8.9									
8/9/97	0	0	24	0	1.32	0	91.9	182.28099	0	0	0	0	24	131.04	24	0	0	24	556.85685	22	8.8									
8/10/97	0	0	24	0	1.34	0	93.3	185.05785	0	0	0	0	24	131.04	24	0	0	24	548.01785	21.9	8.8									
8/11/97	0	0	24	0	1.32	0	91.9	182.28099	0	0	10	11	139.23	13	0	0	24	436.05722	22.5	8.8										
8/12/97	0	0	24	0	1.3	0	88.9	176.33058	0	0	24	0	190.008	0	0	0	24	274.00893	21.8	7										
8/13/97	0	0	24	0	1.3	0	88.9	176.33058	0	0	24	0	190.008	0	0	0	24	291.68592	24.1	7										
8/14/97	0	10	14	0	1.3	0	88.9	176.33058	0	0	24	0	190.008	0	0	0	24	258.54068	20.6	7										
8/15/97	0	24	0	0	1.36	0	95.4	189.22314	0	0	24	0	190.008	0	0	0	24	256.33093	20	7										
8/16/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	24	0	190.008	0	0	0	24	256.33093	20.1	7										
8/17/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	7	17	148.239	0	0	0	24	258.54068	20.7	7										
8/18/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	0	0	24	258.54068	20.5	7										
8/19/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	14.5	0	0	24	411.10754	20.1	8										
8/20/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	24	0	0	24	503.82287	19.8	8.4										
8/21/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	24	0	0	24	494.08387	19.4	8.5										
8/22/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	24	0	0	24	481.72537	18.9	8.5										
8/23/97	0	12	0	0	1.36	0	95.4	184.61157	0	0	15	9	167.895	24	0	0	24	503.82287	19.7	8.6										
8/24/97	0	0	10	0	1.32	0	91.9	175.050413	0	0	24	0	190.008	24	0	0	24	503.82287	19.7	8.6										
8/25/97	0	0	24	0	1.32	0	91.9	182.28099	0	0	16	8	170.352	24	0	0	24	503.82287	19.6	8.6										
8/26/97	0	15	9	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	10.5	13.5	0	24	503.82287	19.7	8.5										
8/27/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	503.82287	19.5	8.5										
8/28/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	494.08387	19.3	8.5										
8/29/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	494.08387	19.2	8.5										
8/30/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	494.08387	19.2	8.5										
8/31/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	494.08387	19.1	8.5										
9/1/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	494.08387	19.1	8.5										
9/2/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	481.72537	18.9	8.5										
9/3/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	381.36592	18.9	8.5										
9/4/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	240.86269	18.9	7										
9/5/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	247.49193	19	7										
9/6/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	240.86269	18.9	7										
9/7/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	240.86269	18.7	7										
9/8/97	0	24	0	0	1.3	0	88.9	176.33058	0	0	0	24	131.04	0	24	0	24	240.86269	18.7	7										
9/9/97	0	23	0	0	1.32	0	91.9	174.68595	0	0	0	24	131.04	0	24	0	24	240.86269	18.8	7										
9/10/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	16	87.36	0	24	0	24	251.91143	19.6	7										
9/11/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	251.91143	19.6	7										
9/12/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	247.49193	19.4	7										
9/13/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	247.49193	19.2	7										
9/14/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	247.49193	19.1	7										
9/15/97	0	24	0	0	1.34	0	93.3	185.05785	0	0	0	24	131.04	0	24	0	24	247.49193	19.1	7										
9/16/97	0	24	0	0	1.32	0	91.9	182.28099	0	0	0	24	131.04	0	24	0	24	240.86269	18.9	7										
9/17/97	15	0	0	0	1.3	0	88.9	176.33058	0	0	0	24	131.04	0	24	0	24	240.86269	18.7	7										
9/18/97	24	0	0	0	1.5	0.66	111.6	221.35537	0	0	0	24	131.04	0	24	0	24	240.86269	18.5	7										
9/19/97	24	0	0	0	1.48	0.58	109.7	217.58678	0	0	16	8	170.352	0	24	0	24	234.23344	18.4	7										
9/20/97	24	0	0	0	1.48	0.56	109.7	217.58678	0	0	24	0	190.008	0	24	0	24	234.23344	18.1	7										
9/21/97</																														

## 1997 Pumping

Date	Shannon							2nd Lift				Bnscoe				Gauges			
	Pumps				Flume		Pumping Rate	Amount acre-feet	Pumps				Amount acre-feet	Pumps		Amount acre-feet	Gauges		
	#1	#2	#3	#4	Up	Down			#1	#2	#3	#4		#1	#2		#3	Suction	Discharge
9/30/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	247.49193	19	7.1
10/1/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	247.49193	19	7.1
10/2/97	0	0	0	0	0	0	0	0	0	0	0	4	21.84	0	24	0	234.23344	18.4	7.1
10/3/97	0	0	0	0	0	0	0	0	0	0	0	4	21.84	0	24	0	234.23344	18.1	7.1
10/4/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	229.81394	17.8	7
10/5/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	229.81394	17.8	7
10/6/97	0	0	0	0	0	0	0	0	0	0	0	4	21.84	0	24	0	234.23344	18.1	7
10/7/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	240.86269	18.6	7
10/8/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	154.68246	19.3	7.2
10/9/97	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	21	0
10/10/97	0	0	0	0	0	0	0	0	0	0	0	0	190.008	0	0	0	0	21	0
10/11/97	0	0	0	0	0	0	0	0	0	0	0	8	93.330	0	0	0	0	21	0
10/12/97	0	0	0	0	0	0	0	0	0	0	0	8	63.336	0	0	0	0	21.6	0
10/13/97	0	0	0	0	0	0	0	0	0	0	0	7	55.419	0	0	0	0	22.9	0
10/14/97	0	0	0	0	3.26	3.26	383	0	0	0	15.5	0	122.7135	0	0	0	0	27.3	0
10/15/97	0	0	0	0	2.7	2.7	284	0	0	0	24	0	190.008	0	0	0	0	27.7	0
10/16/97	0	0	0	0	0.08	0	0	0	0	0	24	0	190.008	0	0	0	0	27	0
10/17/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	0	0	27	0
10/18/97	0	0	0	0	0	0	0	0	0	0	14	0	110.836	0	0	0	0	24.9	0
10/19/97	0	0	0	0	0	0	0	0	0	0	0	12	97.186	0	0	0	0	22.9	0
10/20/97	0	0	0	0	0	0	0	0	0	0	0	12	65.52	0	0	0	0	22.2	0
10/21/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.4	0
10/22/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.8	0
10/23/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.3	0
10/24/97	0.5	0.5	0.5	0	0	0	0	0	0.5	0.5	0.5	0.5	12.021	8	7	7	234.97002	20	6.9
10/25/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	256.33093	20.2	7.2
10/26/97	0	0	0	0	0	0	0	0	0	0	8	0	47.502	24	0	0	251.91143	19.9	7.2
10/27/97	0	0	0	0	0	0	0	0	0	0	8	0	47.502	24	0	0	251.91143	19.8	7.2
10/28/97	0	0	0	0	0	0	0	0	0	0	4	0	31.666	24	0	0	251.91143	19.6	7.2
10/29/97	0	0	0	0	0	0	0	0	0	0	0	0	0	7.5	0	16.5	251.91143	19.6	7.2
10/30/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	251.91143	19.7	7.2
10/31/97	0	0	0	0	0	0	0	0	1	0	0	0	11.84	0	0	24	247.49193	19.3	7.2
11/1/97	0	0	0	0	0	0	0	0	0	0	6	0	47.502	0	0	24	251.91143	19.5	7.1
11/2/97	0	0	0	0	0	0	0	0	0	0	4	0	31.668	0	0	24	247.49193	19.1	7
11/3/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	247.49193	19	7
11/4/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	11	240.86269	18.8	7.1
11/5/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	13	371.32997	18.7	7.9
11/6/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	24	481.72537	18.5	8.7
11/7/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	24	468.46688	18.4	8.7
11/8/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	24	468.46688	18.1	8.7
11/9/97	0	0	0	0	0	0	0	0	5	0	0	0	39.585	24	0	22.5	444.06756	18	8.6
11/10/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	24	468.46688	18	8.6
11/11/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	24	468.46688	18	8.6
11/12/97	0	0	0	0	0	0	0	0	0	1	1	0	18.757	0	16	24	390.36906	18	7.5
11/13/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	24	421.32556	17.9	8.1
11/14/97	0	0	0	0	0	0	0	0	0	5	0	0	39.585	9	7	24	383.02323	17.9	7.5
11/15/97	0	0	0	0	0	0	0	0	10	0	24	0	143.16	24	0	7	311.1143	18.9	7.03
11/16/97	0	0	0	0	0	0	0	0	24	0	0	0	190.008	24	0	0	256.33093	20	7.3
11/17/97	0	0	0	0	0	0	0	0	0	4	8	0	110.696	24	0	0	256.33093	20.3	7.3
11/18/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	256.33093	20	7.2
11/19/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	251.91143	19.9	7.2
11/20/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	251.91143	19.9	7.2
11/21/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	251.91143	19.5	7.3
11/22/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	247.49193	19.2	7.3
11/23/97	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	115.45941	19.5	6.4
11/24/97	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	83.970478	19.6	0
11/25/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251.91143	19.5	7.1
11/26/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	247.49193	19.4	7.1
11/27/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	251.91143	19.8	7.1
11/28/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	247.49193	19.1	7.1
11/29/97	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	247.49193	19.1	7.1
11/30/97	0	0	0	0	0	0	0	0	0	16	0	0	126.672	24	0	0	240.86269	18.5	7.1
12/1/97	0	0	0	0	0	0	0	0	24	0	0	0	190.008	24	0	0	247.49193	19.1	7.1
12/2/97	0	0	0	0	0	0	0	0	14	0	0	0	165.438	24	0	0	291.66892	24.2	7.2
12/3/97	0	0	0	0	0	0	0	0	5	9	0	0	88.725	24	0	0	315.99417	28.4	7.3
12/4/97	0	0	0	0	1.48	1.48	109.7	0	0	15	0	0	118.755	12	0	0	302.73567	26	7.4
12/5/97	0	0	0	0	0.1	0.1	0	0	0	24	0	0	190.008	0	0	0	146.94634	24.8	7.3
12/6/97	0	0	0	0	0	0	0	0	0	24	0	0	190.008	0	0	0	0	24.3	0
12/6/97	0	0	0	0	0	0	0	0	0	24	0	0	190.008	0	0	0	0	25.3	0

	Shannon								2nd Lift					Brescoe					
	Pumps				Flume		Pumping	Amount	Pumps				Amount	Pumps		Amount	Gauges		
Date	#1	#2	#3	#4	Up	Down	Rate	acre-feet	#1	#2	#3	#4	acre-feet	#1	#2	#3	acre-feet	Suction	Discharge
12/7/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	0	0	23.8	0
12/8/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	0	0	24	0
12/9/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	0	0	24.7	0
12/10/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	0	0	25.1	0
12/11/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	0	0	23.6	0
12/12/97	0	0	0	0	0	0	0	0	0	0	8	0	55.096	0	0	0	0	21.6	0
12/13/97	0	0	0	0	0	0	0	0	0	0	6	0	47.502	0	0	6	64.63517	20.6	6.6
12/14/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	64.082733	20.3	6.7
12/15/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	53.862642	20.9	6.7
12/16/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	150.8154	20.6	6.7
12/17/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	256.33093	20	7.1
12/18/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.5	16.5	251.91143	19.7	7.1
12/19/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	251.91143	19.6	7
12/20/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	251.91143	19.5	7
12/21/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	251.91143	19.5	7
12/22/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	24	265.16993	21.1	7
12/23/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	0	0	17.5	188.51925	20.7	7
12/24/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	12	0	0	150.03845	40.3	0
12/25/97	0	0	0	0	0	0	0	0	0	0	24	0	190.008	24	0	0	411.01339	47.1	7.9
12/26/97	0	0	0	0	0	0	0	0	0	0	18	0	142.506	24	0	0	406.59389	46.3	7.9
12/27/97	0	0	0	0	0	0	0	0	0	0	14	0	110.838	9	0	0	144.16615	41.4	0
12/28/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.2	0
12/29/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35.4	0
12/30/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.8	0
12/31/97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31.5	0
	102.5	181.1	669	0				24,034.63	302	6	2236.5	1362	28,434.78	1855.5	2833.5	2202	85,048.65	29.4	

Item	Page
Summary Table: GCWA Water Deliveries .....	D-1
Summary of Annual Water Use .....	D-2

Appendix D: GCWA Water Deliveries

Customer	Contract		1996		1997	
	MGD	AF/YR	MGD	AF/YR	MGD	AF/YR
<b>Industry</b>						
Monsanto	6.0	6,722.1	4.2	4,743.6	4.2	4,692.0
OxyChem	7.9	8,812.7	5.0	5,636.5	5.0	5,574.8
Choc Bayou # 1	13.0	14,563.4	4.3	4,839.9	13.0	14,534.3
Texas Brine	0.8	925.4	0.4	496.3	0.4	473.9
ISP	1.0	1,120.3		-	0.8	908.5
Spot Water			0.0	9.2	0.1	81.6
<b>Total:</b>	<b>28.7</b>	<b>32,143.9</b>	<b>14.0</b>	<b>15,725.5</b>	<b>23.4</b>	<b>26,265.2</b>
<b>Irrigation:</b>						
Fluor Daniel	0.1	89.6	0.1	72.8	0.0	43.7
Choc Bayou # 3			8.0	8,906.8		
Amer. Golf	0.3	331.6	0.3	331.6	0.2	187.1
Sugar Creek	0.2	235.3	0.0	1.1	0.2	266.6
Golf Unlimited	0.2	199.4	0.1	136.7	0.1	87.4
Riverbend	0.1	153.5	0.1	71.7	0.1	97.5
Texas DOC	0.2	183.7	0.1	103.1	0.0	12.3
Rice Crop			16.0	17,870.5	9.1	10,186.9
Row Crop		-	0.7	793.5		-
Tx City Golf					0.1	74.3
Spot Water			0.1	67.4	0.0	17.2
<b>Total:</b>	<b>1.1</b>	<b>1,193.2</b>	<b>25.3</b>	<b>28,355.2</b>	<b>9.8</b>	<b>10,972.9</b>
<b>Water Plant</b>	<b>18.0</b>	<b>20,166.3</b>	<b>12.7</b>	<b>15,464.0</b>	<b>12.8</b>	<b>16,083.1</b>
<b>T.C. Industry</b>	<b>62.4</b>	<b>69,925.4</b>	<b>54.3</b>	<b>60,853.7</b>	<b>59.8</b>	<b>67,022.5</b>
<b>Totals:</b>	<b>110.2</b>	<b>123,428.7</b>	<b>145.7</b>	<b>120,398.4</b>	<b>139.1</b>	<b>120,343.7</b>

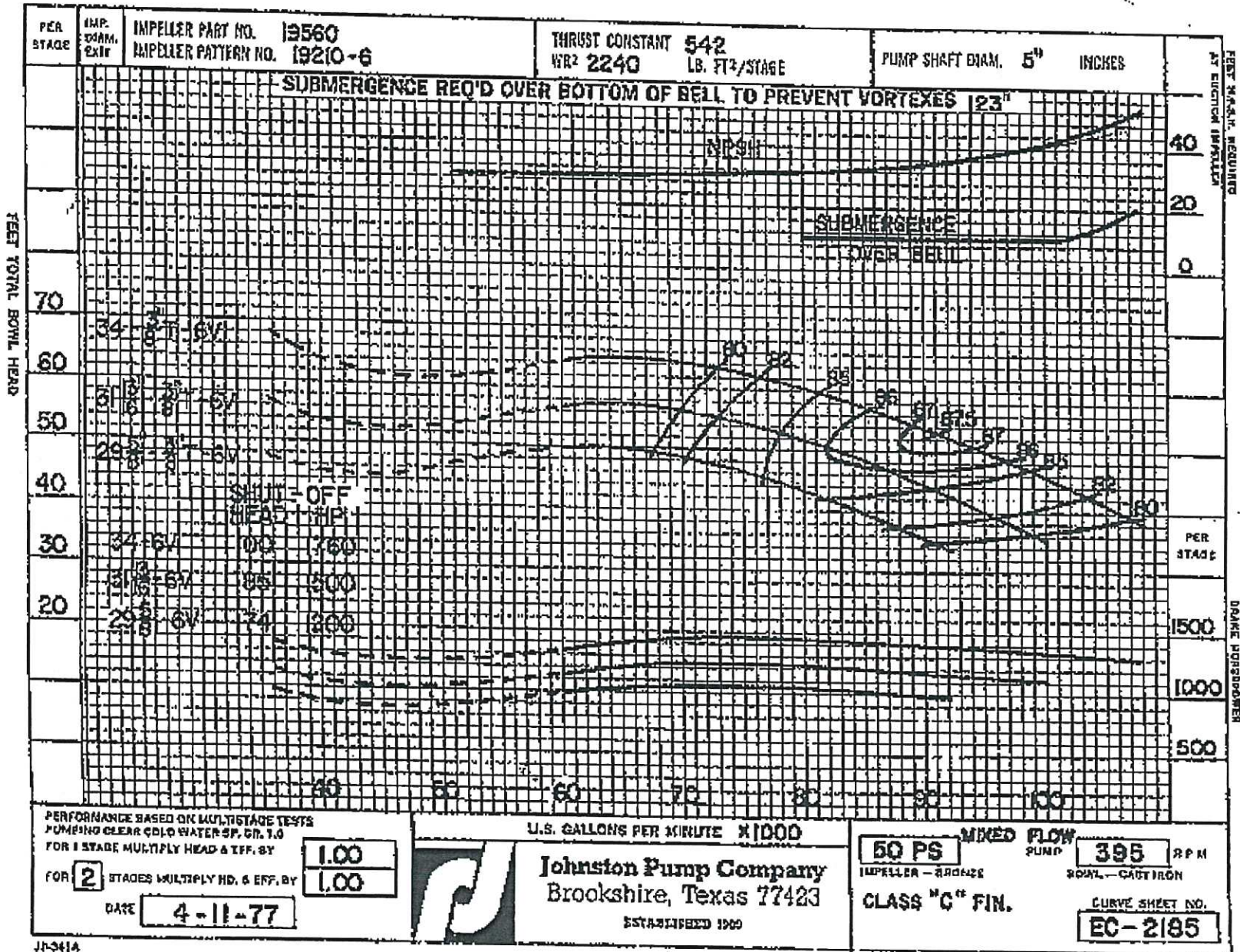


Month	Winter 2019-2020 (Jan)			Spring 2020-2021 (Feb)			Summer 2021-2022 (Mar)			Autumn 2022-2023 (Apr)			Winter 2023-2024 (May)			Spring 2024-2025 (Jun)			Summer 2025-2026 (Jul)			Autumn 2026-2027 (Aug)			Winter 2027-2028 (Sep)			Spring 2028-2029 (Oct)			Summer 2029-2030 (Nov)			Autumn 2030-2031 (Dec)			Winter 2031-2032 (Jan)			Spring 2032-2033 (Feb)			Summer 2033-2034 (Mar)			Autumn 2034-2035 (Apr)			Winter 2035-2036 (May)			Spring 2036-2037 (Jun)			Summer 2037-2038 (Jul)			Autumn 2038-2039 (Aug)			Winter 2039-2040 (Sep)			Spring 2040-2041 (Oct)			Summer 2041-2042 (Nov)			Autumn 2042-2043 (Dec)			Winter 2043-2044 (Jan)			Spring 2044-2045 (Feb)			Summer 2045-2046 (Mar)			Autumn 2046-2047 (Apr)			Winter 2047-2048 (Sep)			Spring 2048-2049 (Oct)			Summer 2049-2050 (Nov)			Autumn 2050-2051 (Dec)			Winter 2051-2052 (Jan)			Spring 2052-2053 (Feb)			Summer 2053-2054 (Mar)			Autumn 2054-2055 (Apr)			Winter 2055-2056 (May)			Spring 2056-2057 (Jun)			Summer 2057-2058 (Jul)			Autumn 2058-2059 (Aug)			Winter 2059-2060 (Sep)			Spring 2060-2061 (Oct)			Summer 2061-2062 (Nov)			Autumn 2062-2063 (Dec)			Winter 2063-2064 (Jan)			Spring 2064-2065 (Feb)			Summer 2065-2066 (Mar)			Autumn 2066-2067 (Apr)			Winter 2067-2068 (Sep)			Spring 2068-2069 (Oct)			Summer 2069-2070 (Nov)			Autumn 2070-2071 (Dec)			Winter 2071-2072 (Jan)			Spring 2072-2073 (Feb)			Summer 2073-2074 (Nov)			Autumn 2074-2075 (Dec)			Winter 2075-2076 (Jan)			Spring 2076-2077 (Feb)			Summer 2077-2078 (Nov)			Autumn 2078-2079 (Dec)			Winter 2079-2080 (Jan)			Spring 2080-2081 (Feb)			Summer 2081-2082 (Nov)			Autumn 2082-2083 (Dec)			Winter 2083-2084 (Jan)			Spring 2084-2085 (Feb)			Summer 2085-2086 (Nov)			Autumn 2086-2087 (Dec)			Winter 2087-2088 (Jan)			Spring 2088-2089 (Feb)			Summer 2089-2090 (Nov)			Autumn 2090-2091 (Dec)			Winter 2091-2092 (Jan)			Spring 2092-2093 (Feb)			Summer 2093-2094 (Nov)			Autumn 2094-2095 (Dec)			Winter 2095-2096 (Jan)			Spring 2096-2097 (Feb)			Summer 2097-2098 (Nov)			Autumn 2098-2099 (Dec)			Winter 2099-2100 (Jan)			Spring 2100-2101 (Feb)			Summer 2101-2102 (Nov)			Autumn 2102-2103 (Dec)			Winter 2103-2104 (Jan)			Spring 2104-2105 (Feb)			Summer 2105-2106 (Nov)			Autumn 2106-2107 (Dec)			Winter 2107-2108 (Jan)			Spring 2108-2109 (Feb)			Summer 2109-2110 (Nov)			Autumn 2110-2111 (Dec)			Winter 2111-2112 (Jan)			Spring 2112-2113 (Feb)			Summer 2113-2114 (Nov)			Autumn 2114-2115 (Dec)			Winter 2115-2116 (Jan)			Spring 2116-2117 (Feb)			Summer 2117-2118 (Nov)			Autumn 2118-2119 (Dec)			Winter 2119-2120 (Jan)			Spring 2120-2121 (Feb)			Summer 2121-2122 (Nov)			Autumn 2122-2123 (Dec)			Winter 2123-2124 (Jan)			Spring 2124-2125 (Feb)			Summer 2125-2126 (Nov)			Autumn 2126-2127 (Dec)			Winter 2127-2128 (Jan)			Spring 2128-2129 (Feb)			Summer 2129-2130 (Nov)			Autumn 2130-2131 (Dec)			Winter 2131-2132 (Jan)			Spring 2132-2133 (Feb)			Summer 2133-2134 (Nov)			Autumn 2134-2135 (Dec)			Winter 2135-2136 (Jan)			Spring 2136-2137 (Feb)			Summer 2137-2138 (Nov)			Autumn 2138-2139 (Dec)			Winter 2139-2140 (Jan)			Spring 2140-2141 (Feb)			Summer 2141-2142 (Nov)			Autumn 2142-2143 (Dec)			Winter 2143-2144 (Jan)			Spring 2144-2145 (Feb)			Summer 2145-2146 (Nov)			Autumn 2146-2147 (Dec)			Winter 2147-2148 (Jan)			Spring 2148-2149 (Feb)			Summer 2149-2150 (Nov)			Autumn 2150-2151 (Dec)			Winter 2151-2152 (Jan)			Spring 2152-2153 (Feb)			Summer 2153-2154 (Nov)			Autumn 2154-2155 (Dec)			Winter 2155-2156 (Jan)			Spring 2156-2157 (Feb)			Summer 2157-2158 (Nov)			Autumn 2158-2159 (Dec)			Winter 2159-2160 (Jan)			Spring 2160-2161 (Feb)			Summer 2161-2162 (Nov)			Autumn 2162-2163 (Dec)			Winter 2163-2164 (Jan)			Spring 2164-2165 (Feb)			Summer 2165-2166 (Nov)			Autumn 2166-2167 (Dec)			Winter 2167-2168 (Jan)			Spring 2168-2169 (Feb)			Summer 2169-2170 (Nov)			Autumn 2170-2171 (Dec)			Winter 2171-2172 (Jan)			Spring 2172-2173 (Feb)			Summer 2173-2174 (Nov)			Autumn 2174-2175 (Dec)			Winter 2175-2176 (Jan)			Spring 2176-2177 (Feb)			Summer 2177-2178 (Nov)			Autumn 2178-2179 (Dec)			Winter 2179-2180 (Jan)			Spring 2180-2181 (Feb)			Summer 2181-2182 (Nov)			Autumn 2182-2183 (Dec)			Winter 2183-2184 (Jan)			Spring 2184-2185 (Feb)			Summer 2185-2186 (Nov)			Autumn 2186-2187 (Dec)			Winter 2187-2188 (Jan)			Spring 2188-2189 (Feb)			Summer 2189-2190 (Nov)			Autumn 2190-2191 (Dec)			Winter 2191-2192 (Jan)			Spring 2192-2193 (Feb)			Summer 2193-2194 (Nov)			Autumn 2194-2195 (Dec)			Winter 2195-2196 (Jan)			Spring 2196-2197 (Feb)			Summer 2197-2198 (Nov)			Autumn 2198-2199 (Dec)			Winter 2199-2200 (Jan)			Spring 2200-2201 (Feb)			Summer 2201-2202 (Nov)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg																																																																																																																																																

Source: Annual Water Use Reports to the Texas Natural Resource Conservation Commission  
1961 report dated February 24, 1962  
1966 report dated September 30, 1967  
1967 report dated March 10, 1968

<b>Item</b>	<b>Page</b>
Shannon Pump # 4 .....	E-1
Johnston Pump Company, Curve EC-2185	
Second Lift Pump # 3.....	E-2
Lo-Lift Pump Company, Curve No. 4836	
Second Lift Pump # 4.....	E-3
Southern Engine and Pump Company, Fairbanks Morse Figure 6310	
Shannon Pump # 2 .....	E-4
Dayton Pump, Calculated from available data	
Briscoe Pumps (All) .....	E-5
Dayton Pump, Calculated from available data	





JN-414

500-17-03 NOV 10:42 AM JOHNSTON PUMP ENGINEERS FAX: 2819346054 PAGE 2



20-10-1558 11:45

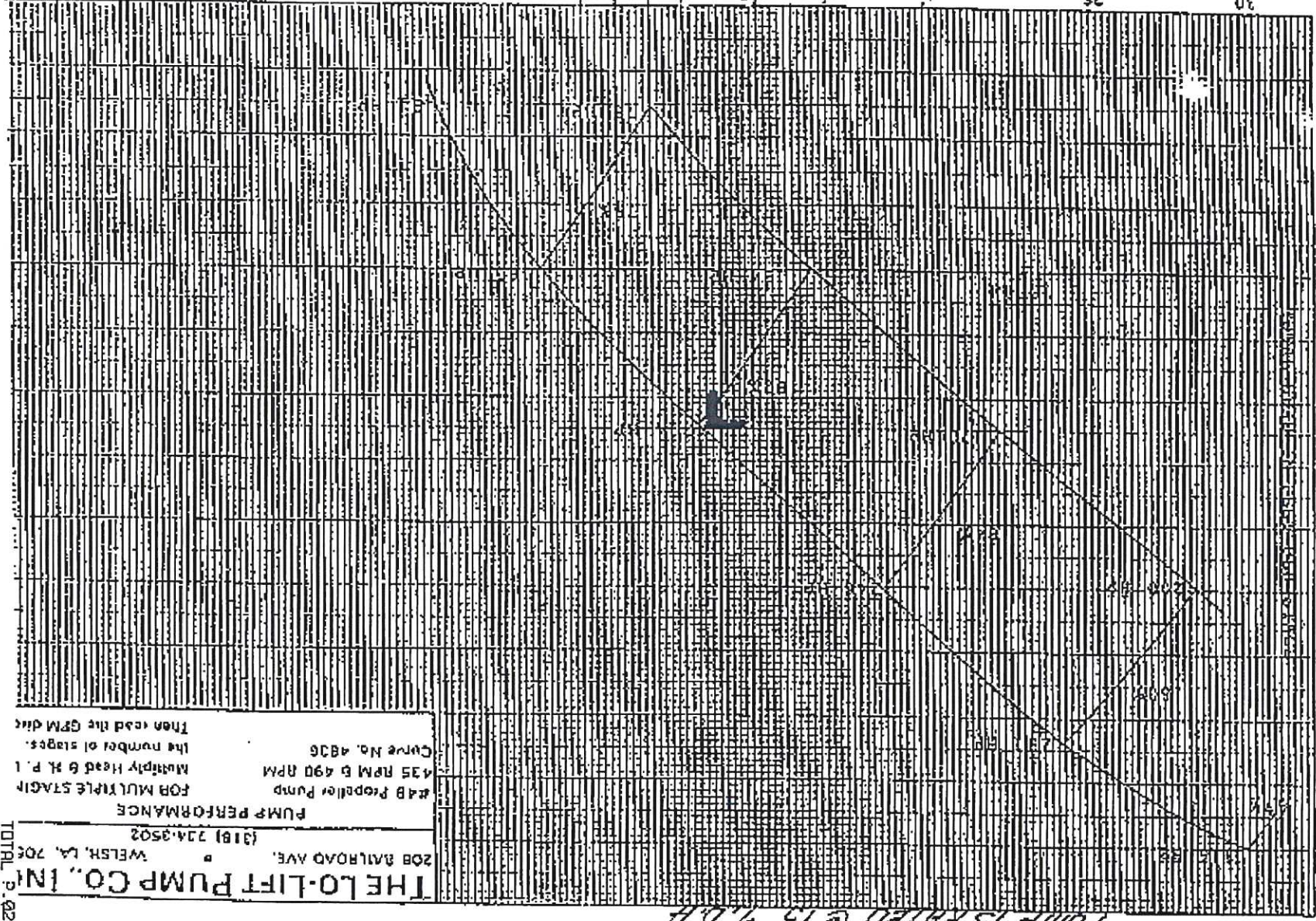
LO-LIFT PUMP

15

20

25

PUMP IS RATED @ 15' T.D.H.



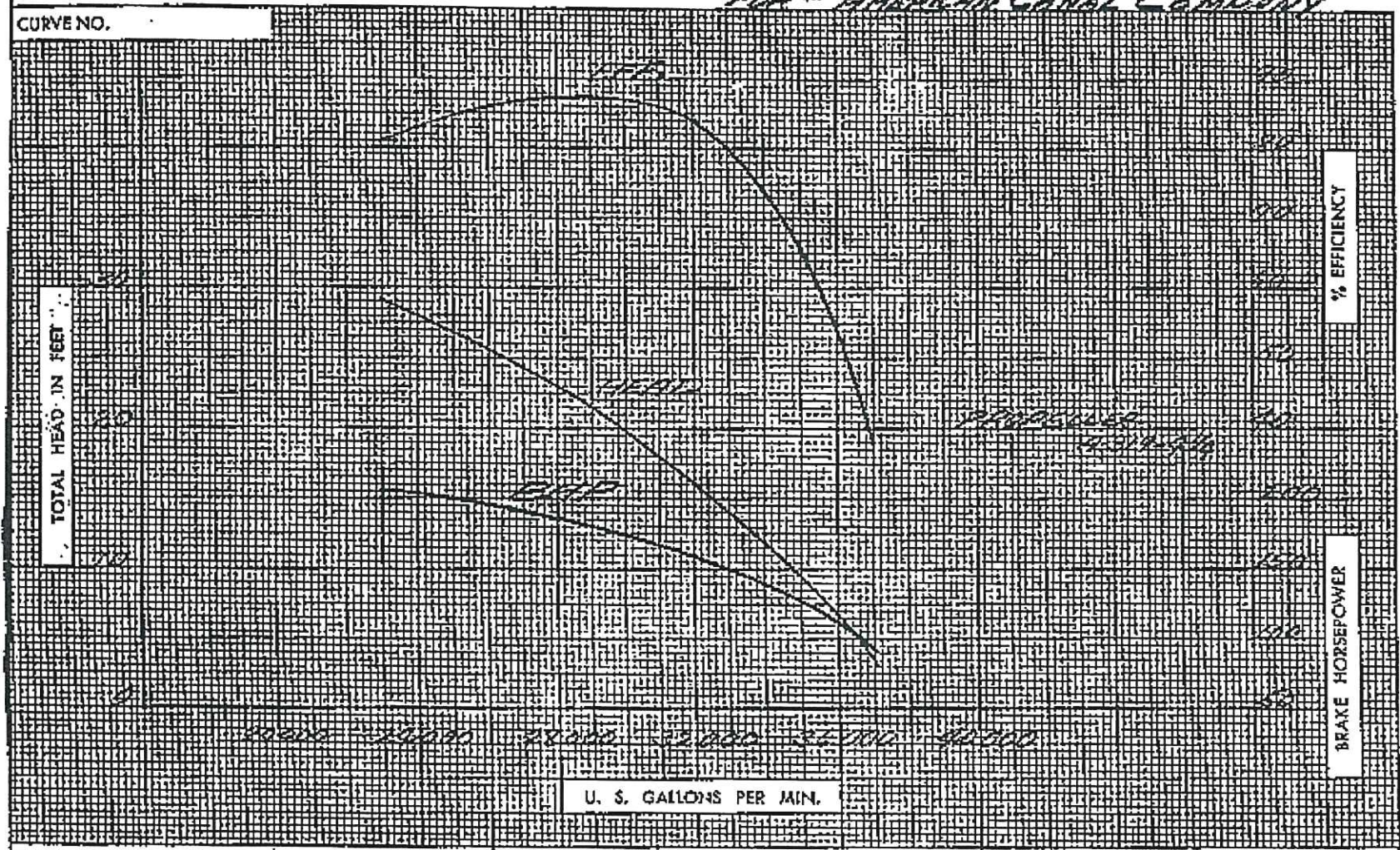
THOUSANDS OF GALLONS PER MINUTE

THE LO-LIFT PUMP CO. INC.  
 208 RAILROAD AVE.  
 WELSH, LA. 70082  
 (318) 234-3502  
 PUMP PERFORMANCE  
 435 RPM @ 490 RPM  
 435 RPM @ 490 RPM  
 Multiply Head by P. 1  
 the number of stages.  
 Then read the GPM dia

TOTAL 9.02



FOR - AMERICAN CANAL COMPANY



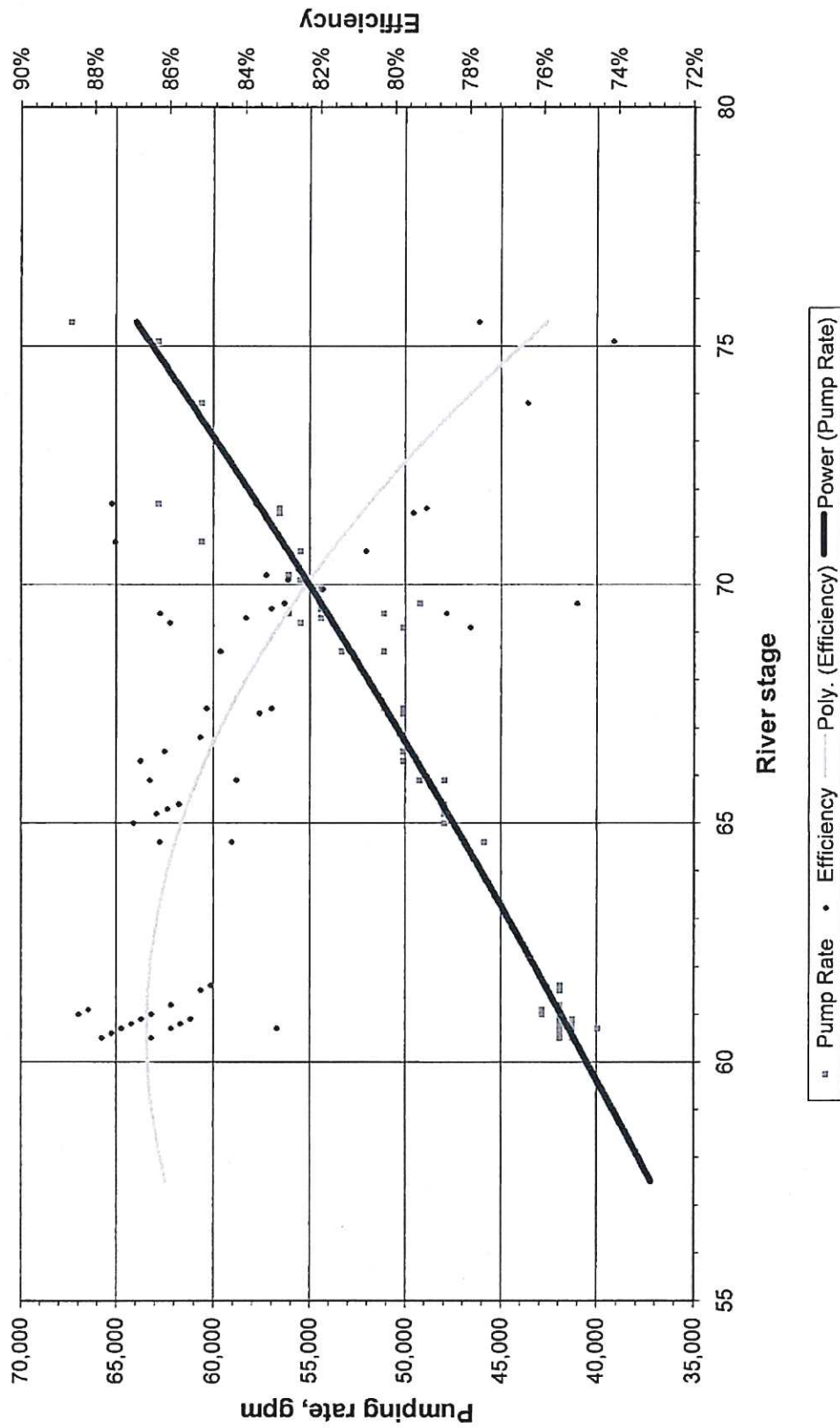
THE PUMP IS GUARANTEED FOR THE CONDITIONS SPECIFIED, OTHER POINTS ON THE CURVE ARE APPROXIMATE. MAT'L PUMPED WATER

SOUTHERN ENGINE AND PUMP COMPANY  
HOUSTON, KILGORE, SAN ANTONIO,  
DALLAS, EDINBURG, CORPUS CHRISTI,  
HOUMA, NEW ORLEANS.

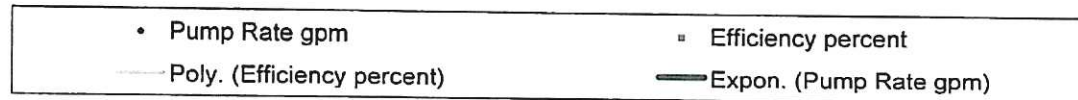
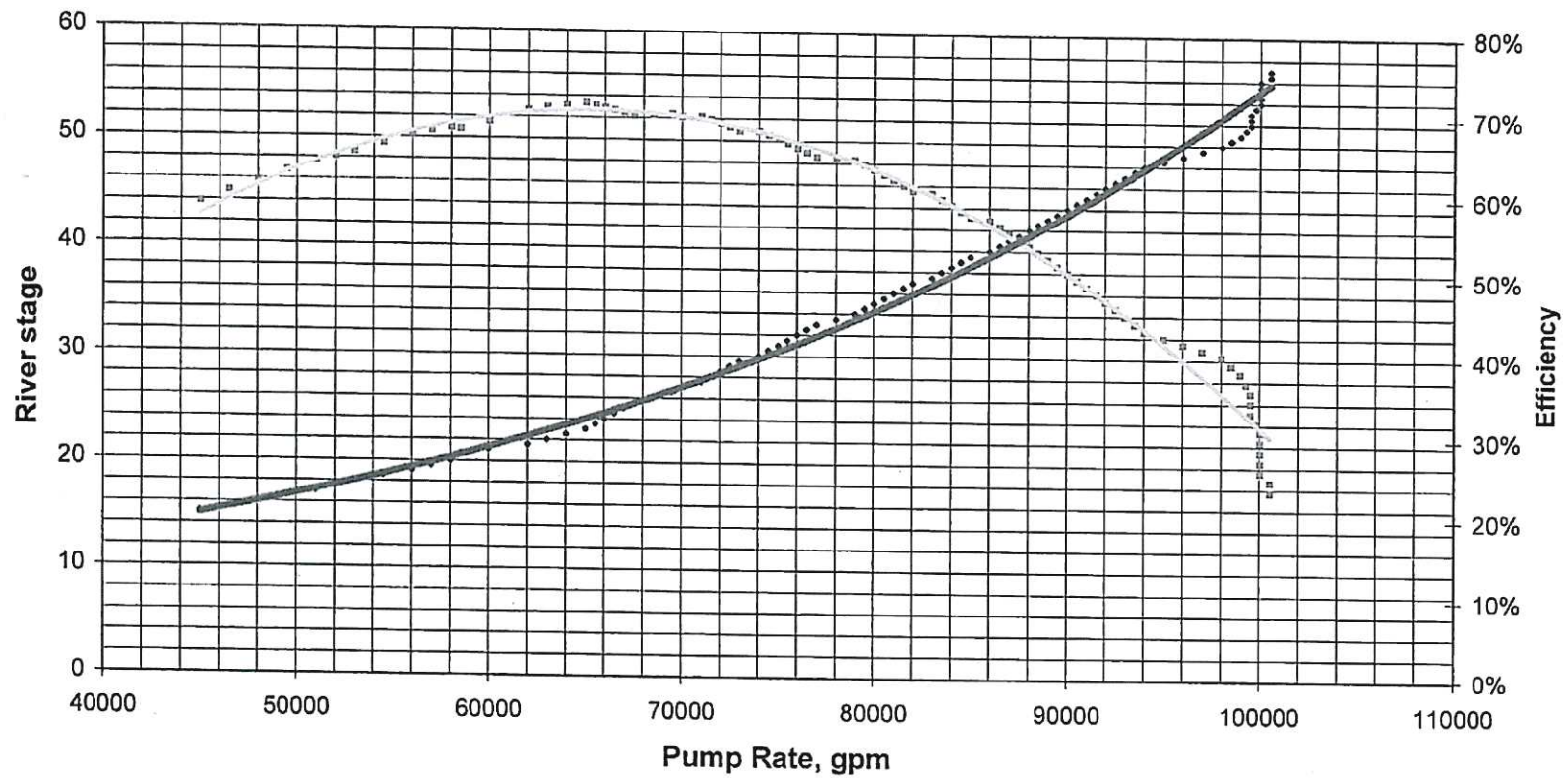
PUMP FM 616-6310  
SIZE 3.6" SPEED 3500 RPM  
DATE 7-17-53



Calculated Pump Curve  
Shannon Pump #2



# Calculated Pump Curve Dayton Pumps, Briscoe Pump Station



Item	Page
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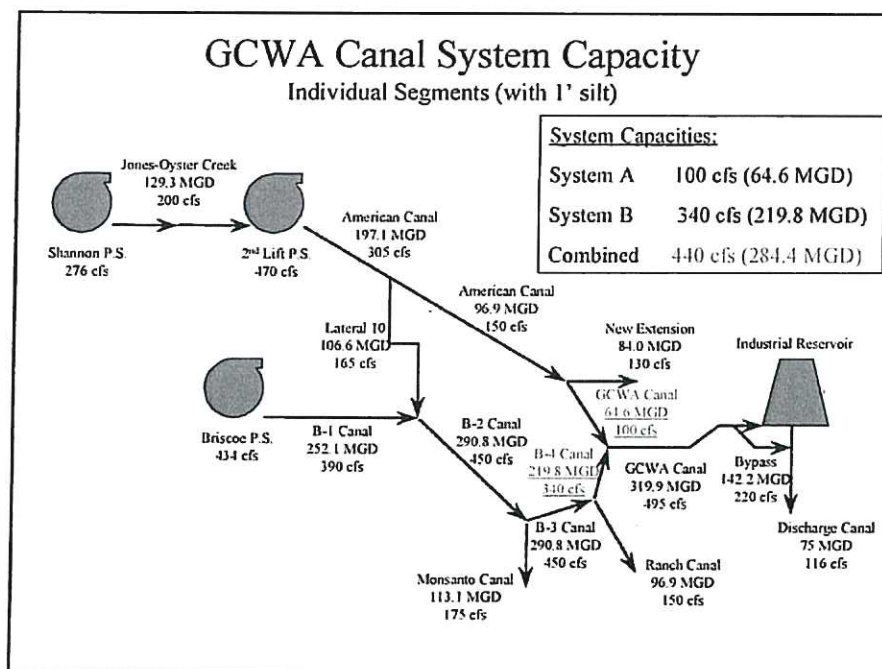
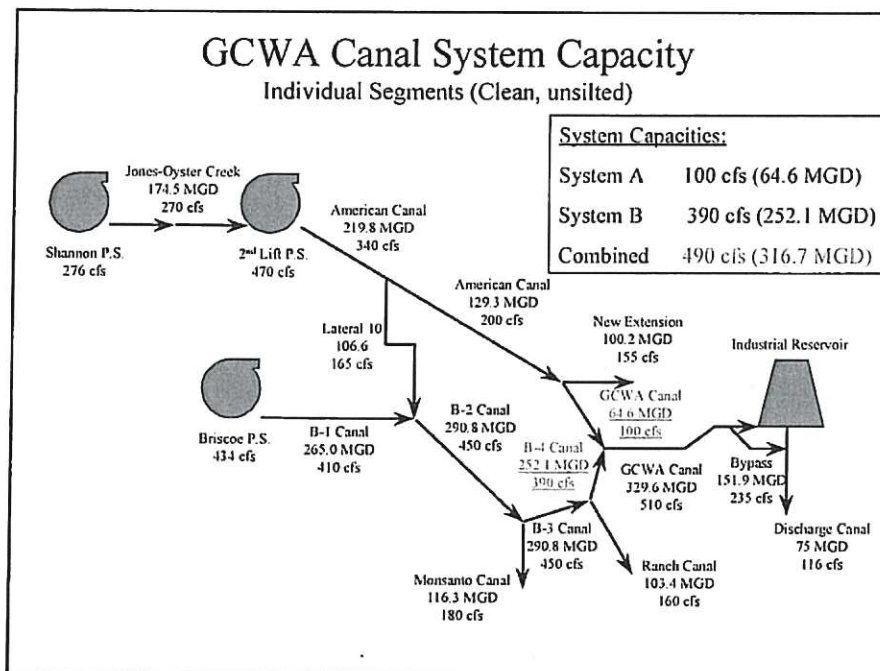
GCWA Canal System Capacity Diagrams

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1997 Collected Runoff and Spills .....	F-8
1997 Net Evaporation and Seepage Losses .....	F-9
1997 Diversions & Customer Deliveries .....	F-9

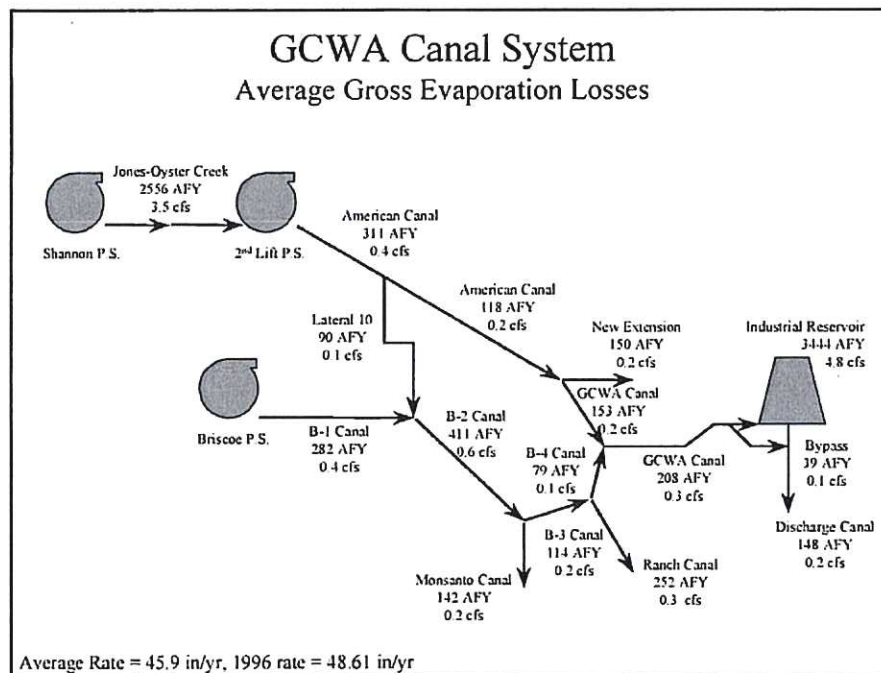
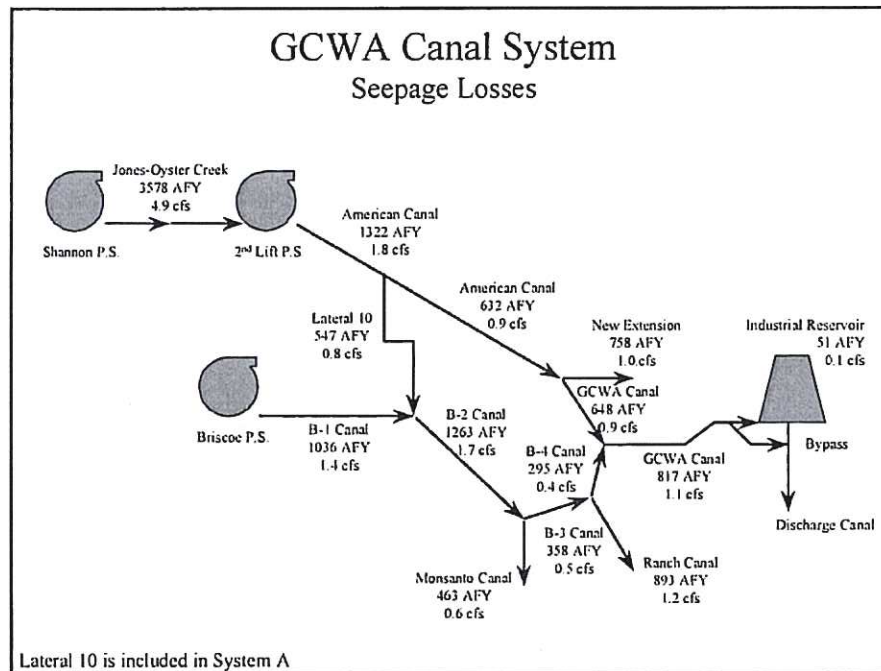
HEC-RAS Model Canal Elevation Profiles

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## Appendix F: Canal Capacity Diagrams

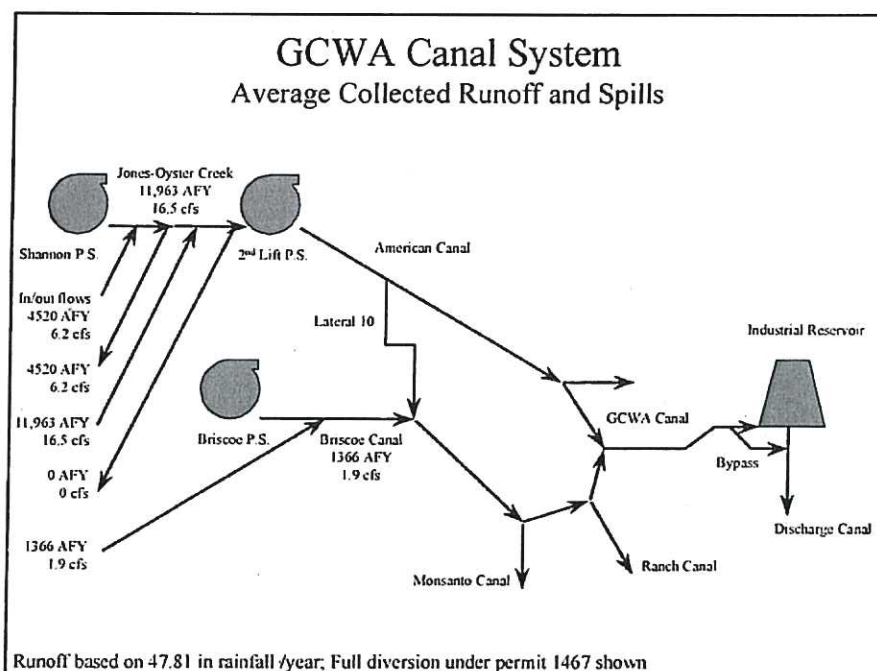
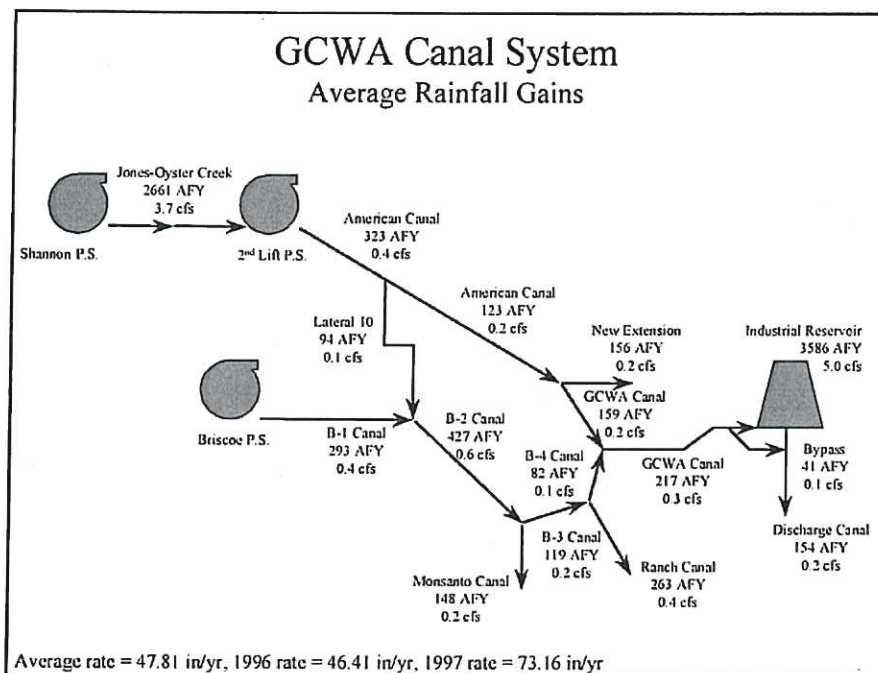


## Appendix F: Canal Capacity Diagrams

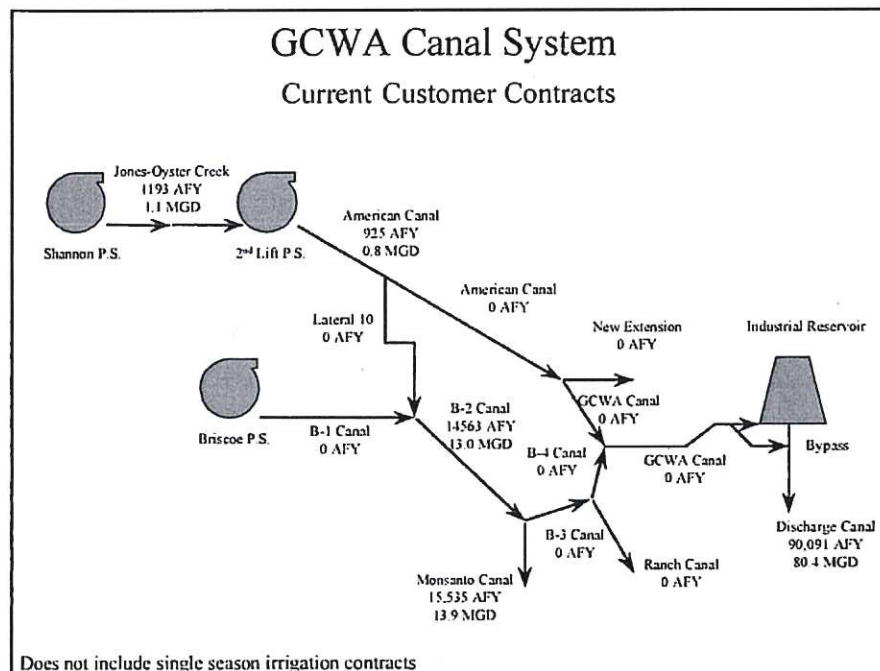
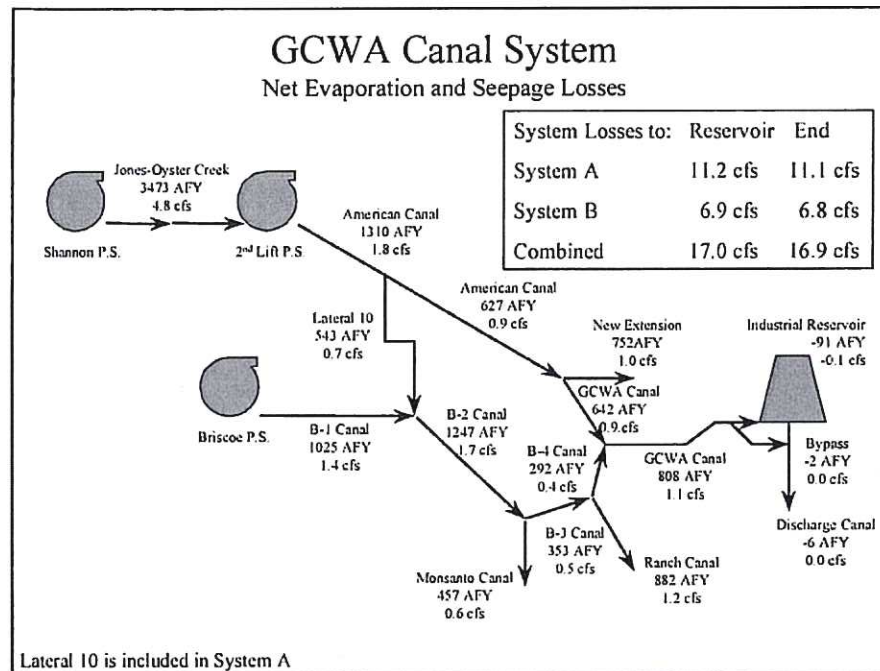




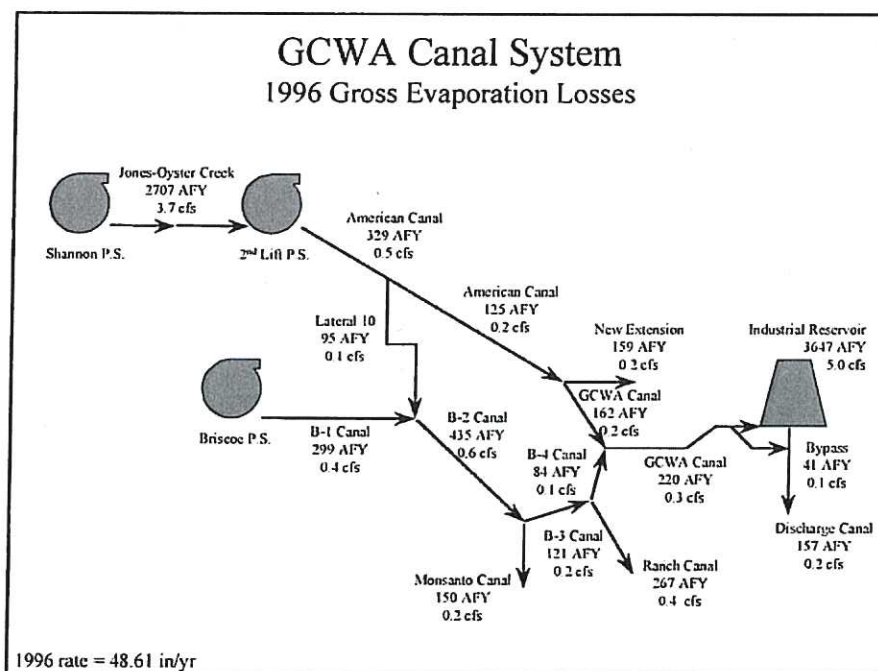
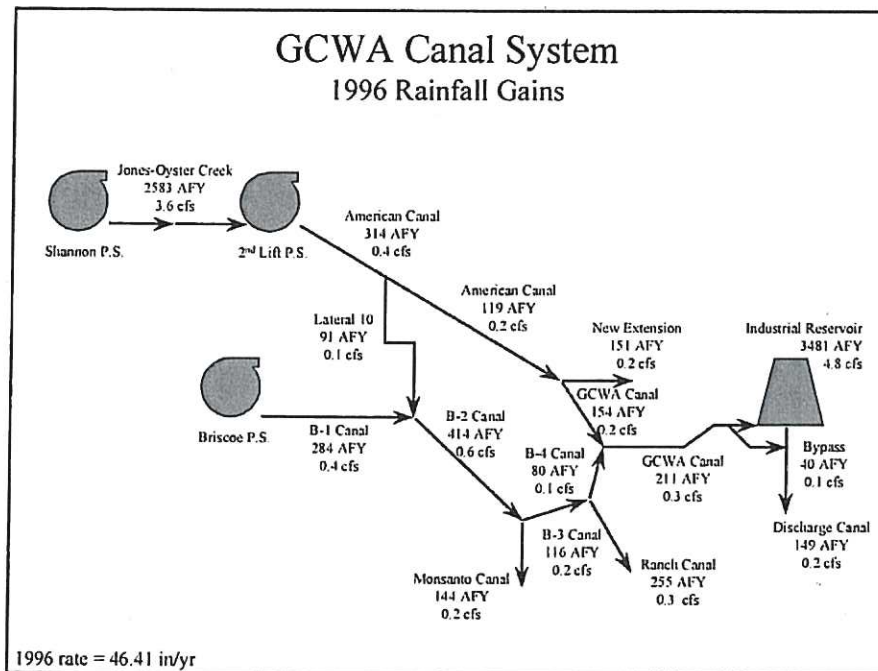
## Appendix F: Canal Capacity Diagrams



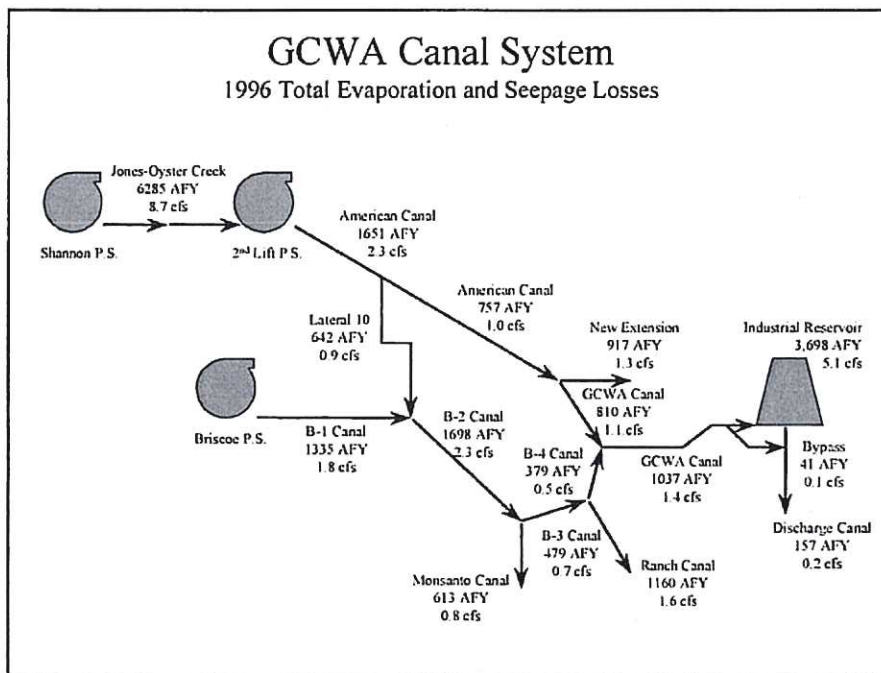
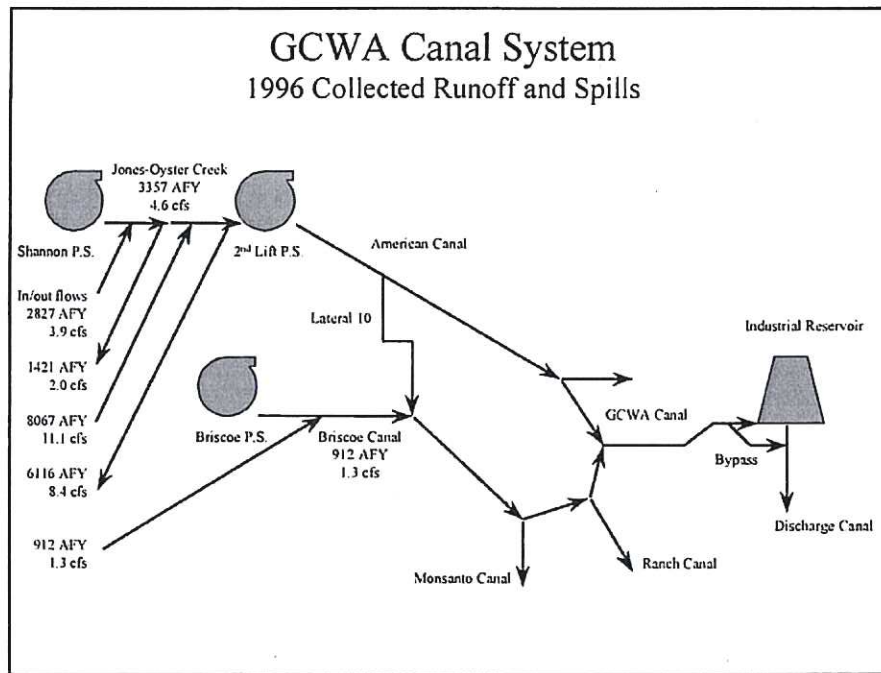
## Appendix F: Canal Capacity Diagrams



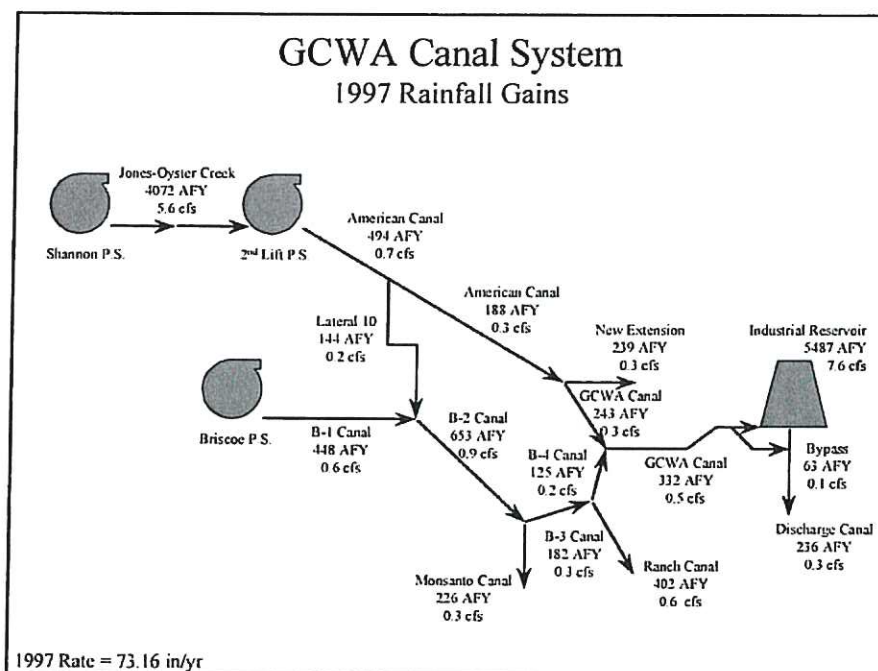
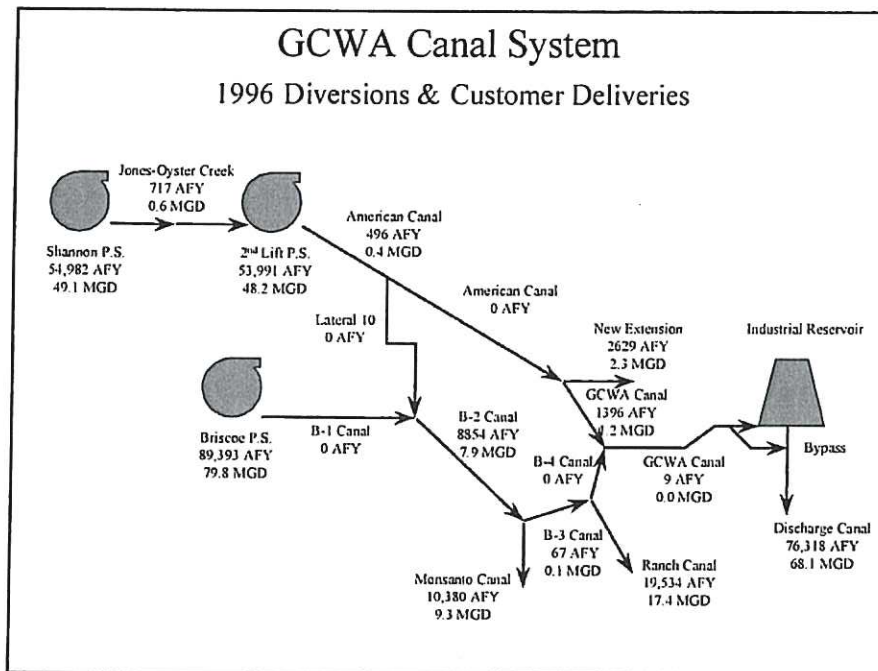
## Appendix F: Canal Capacity Diagrams



## Appendix F: Canal Capacity Diagrams

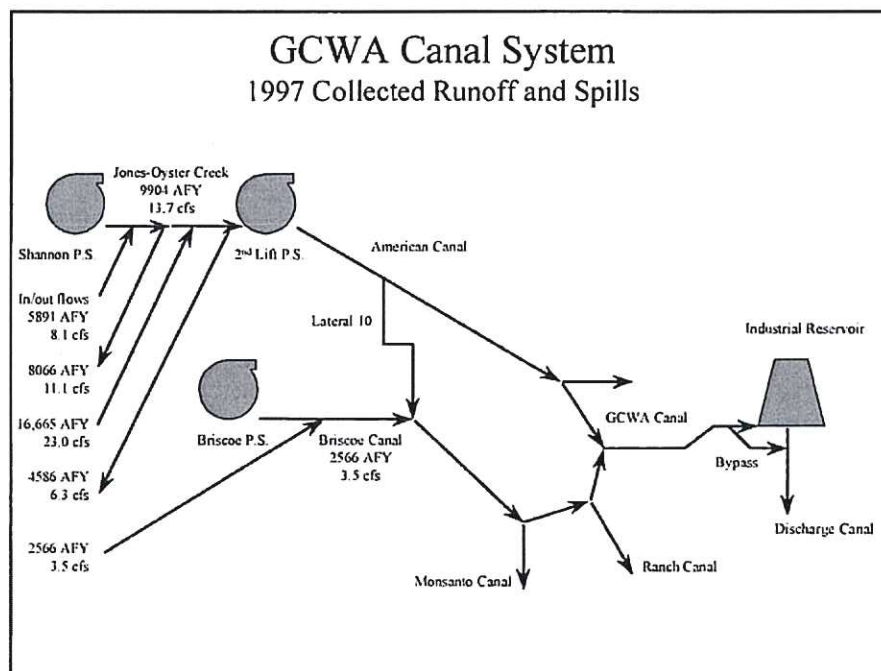
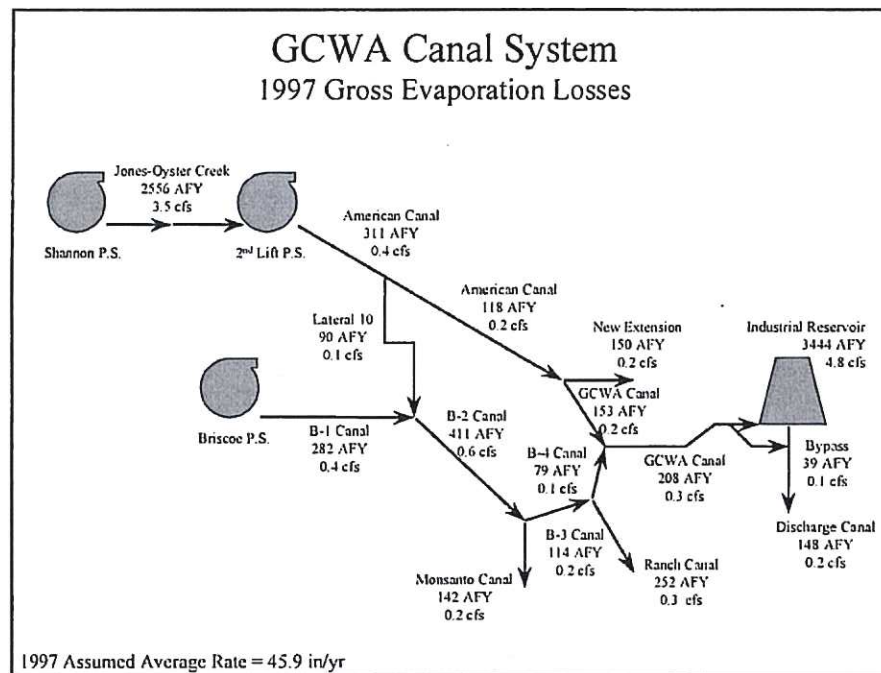


## Appendix F: Canal Capacity Diagrams

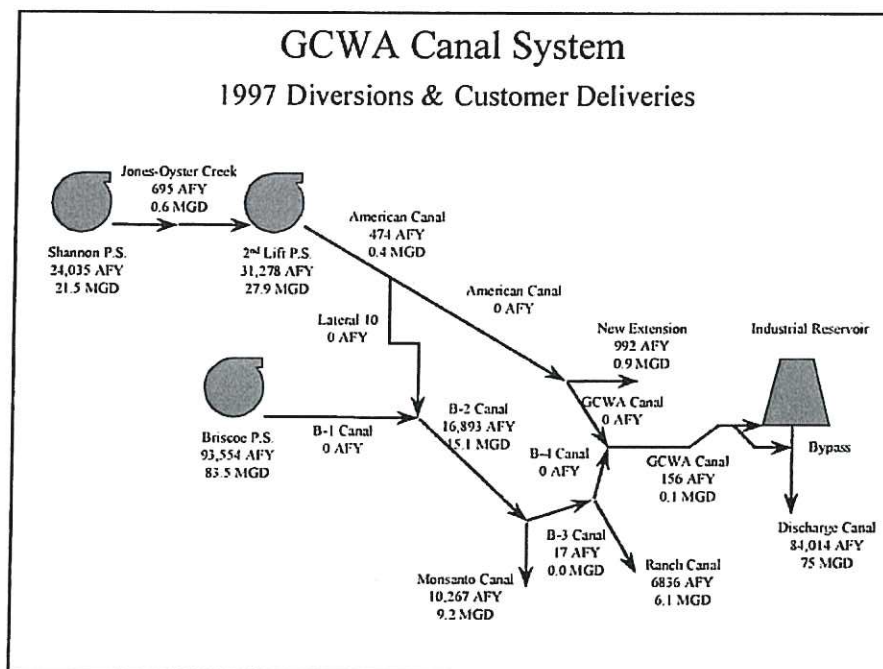
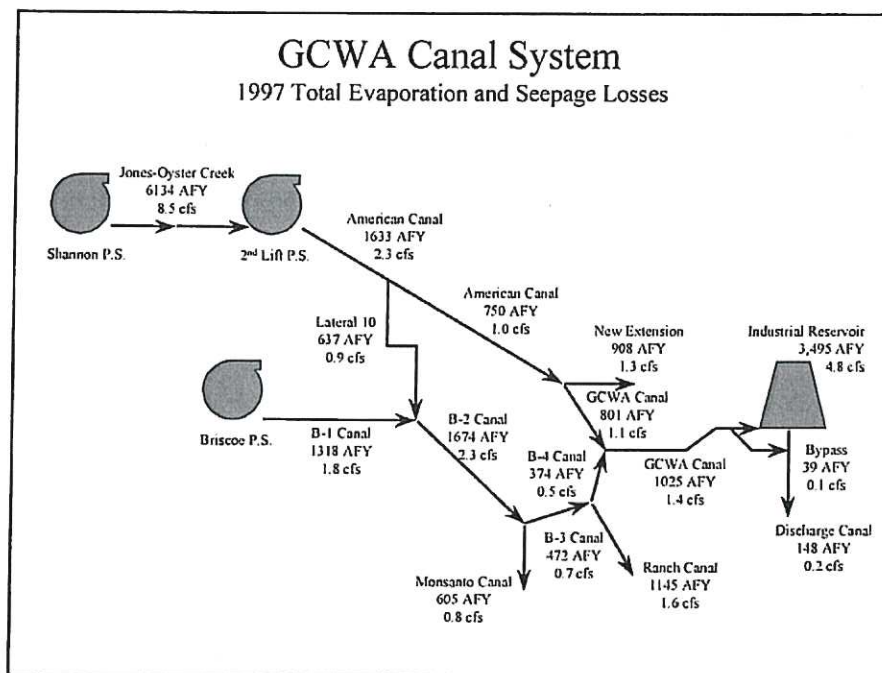


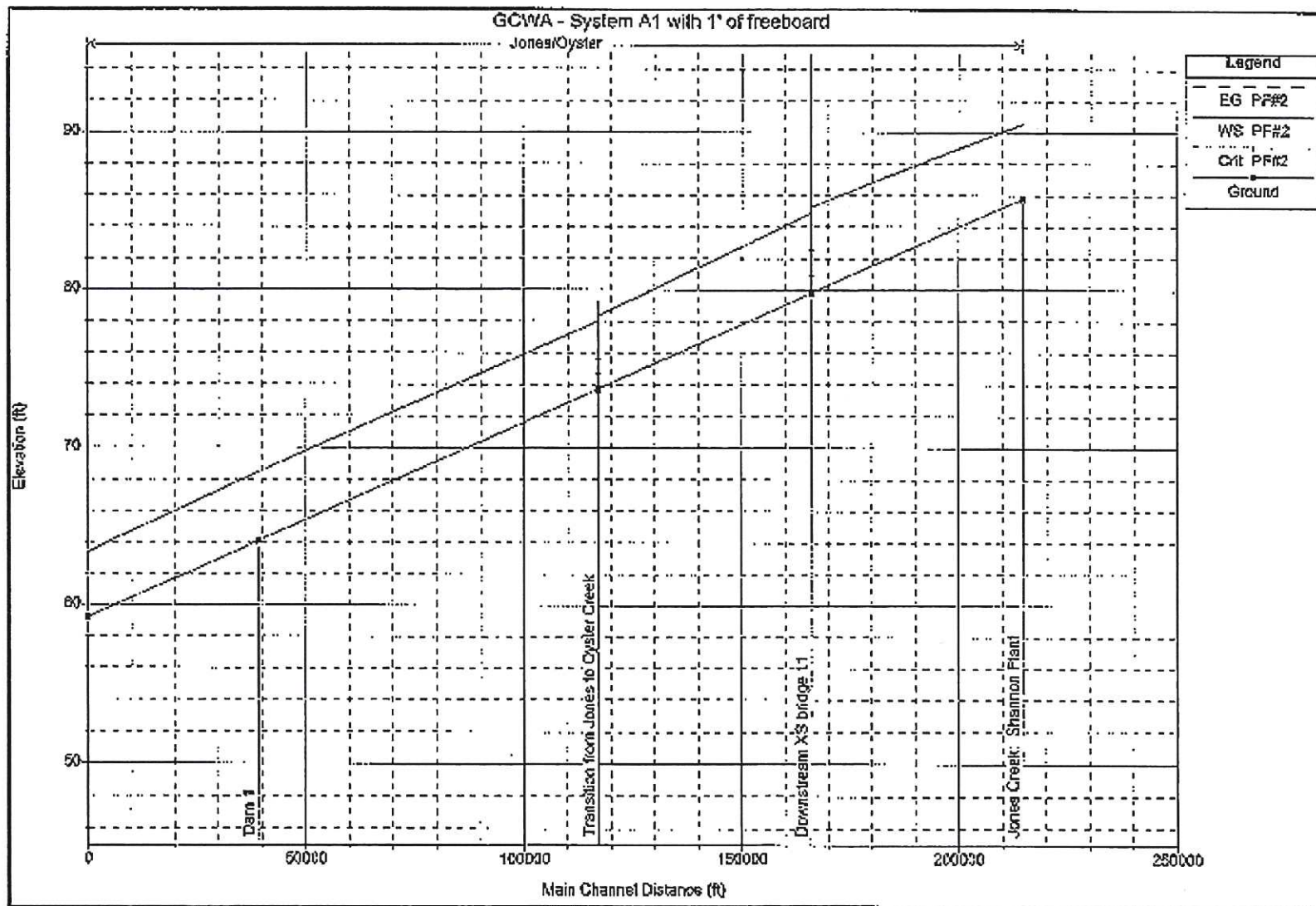


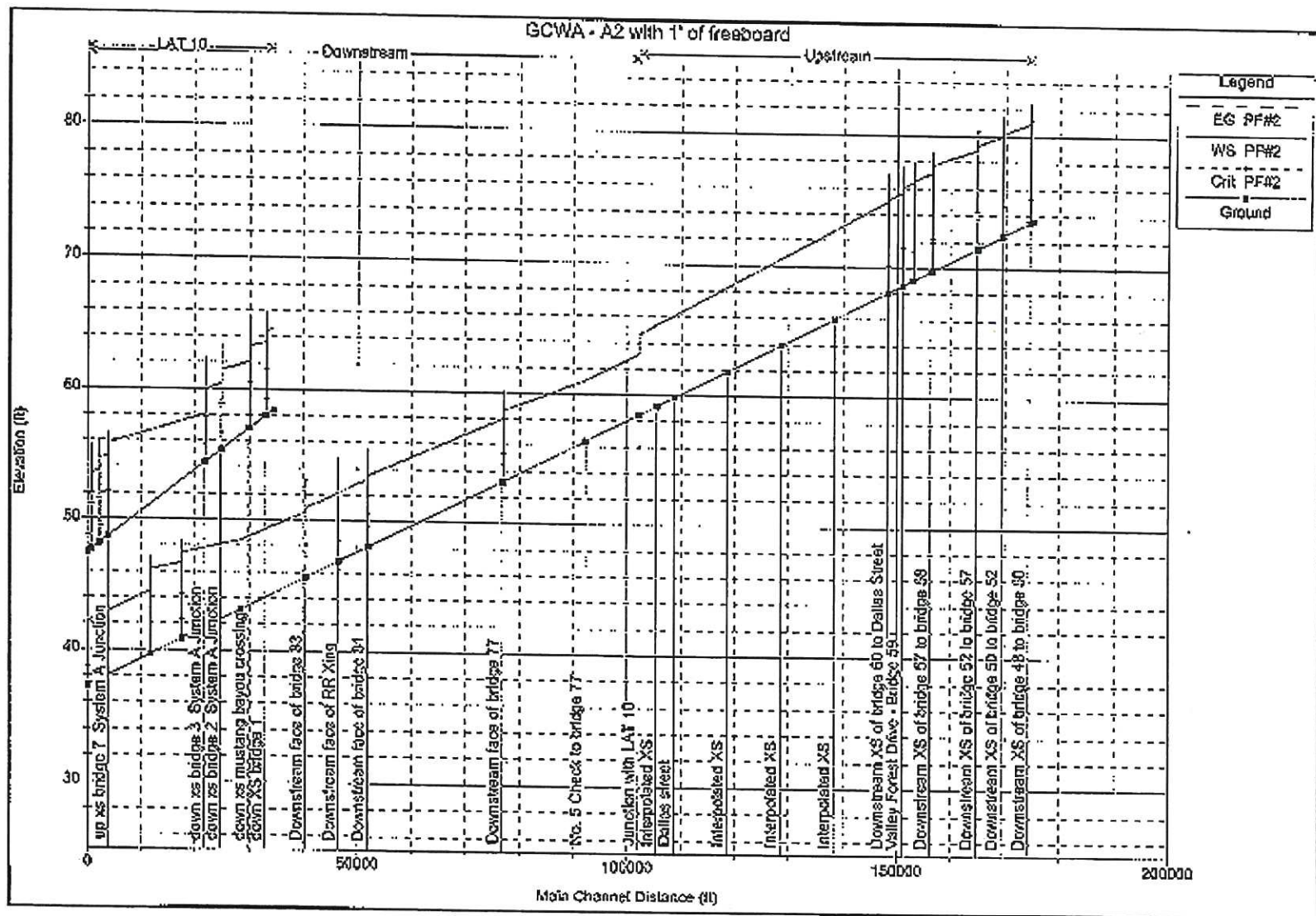
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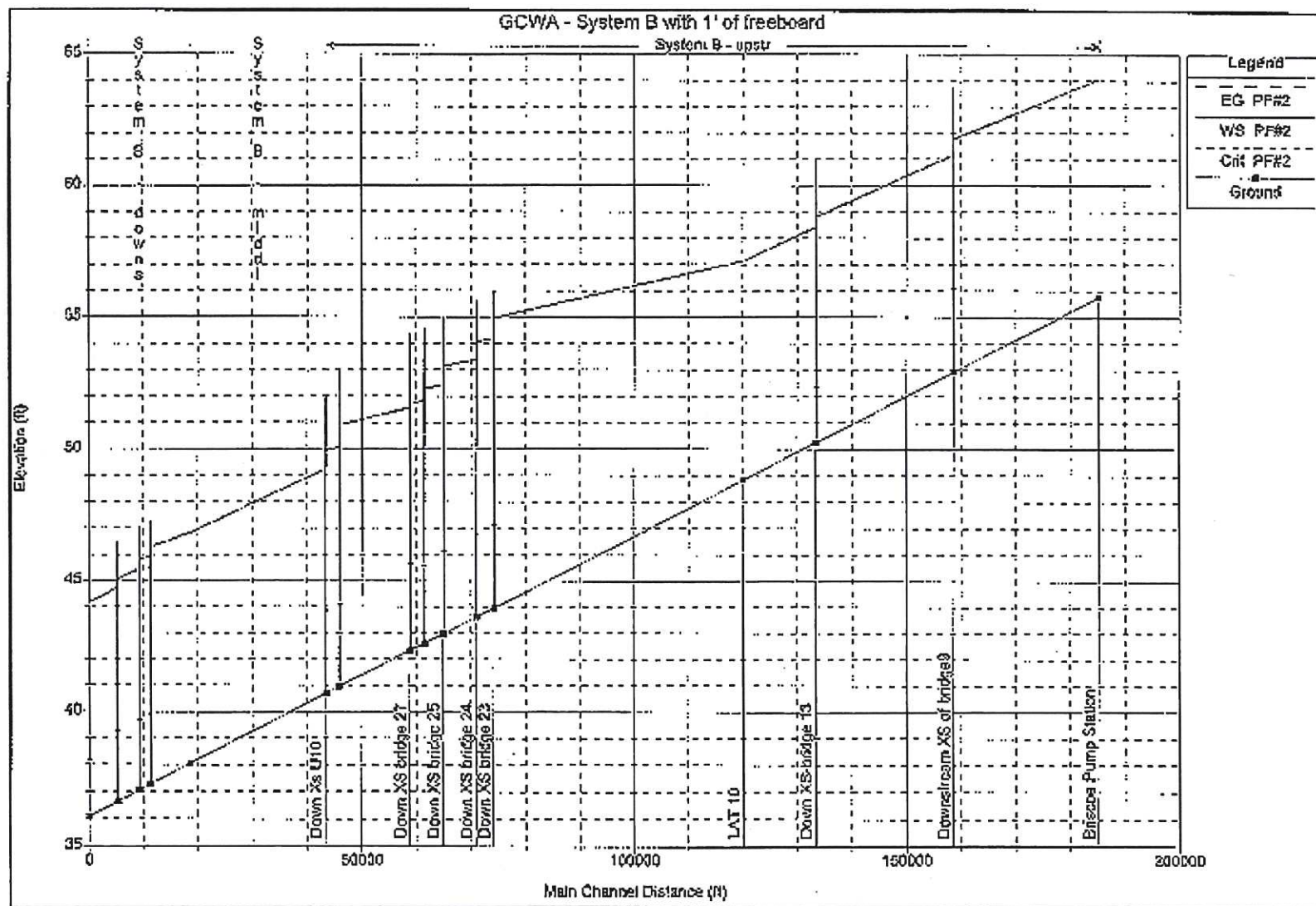
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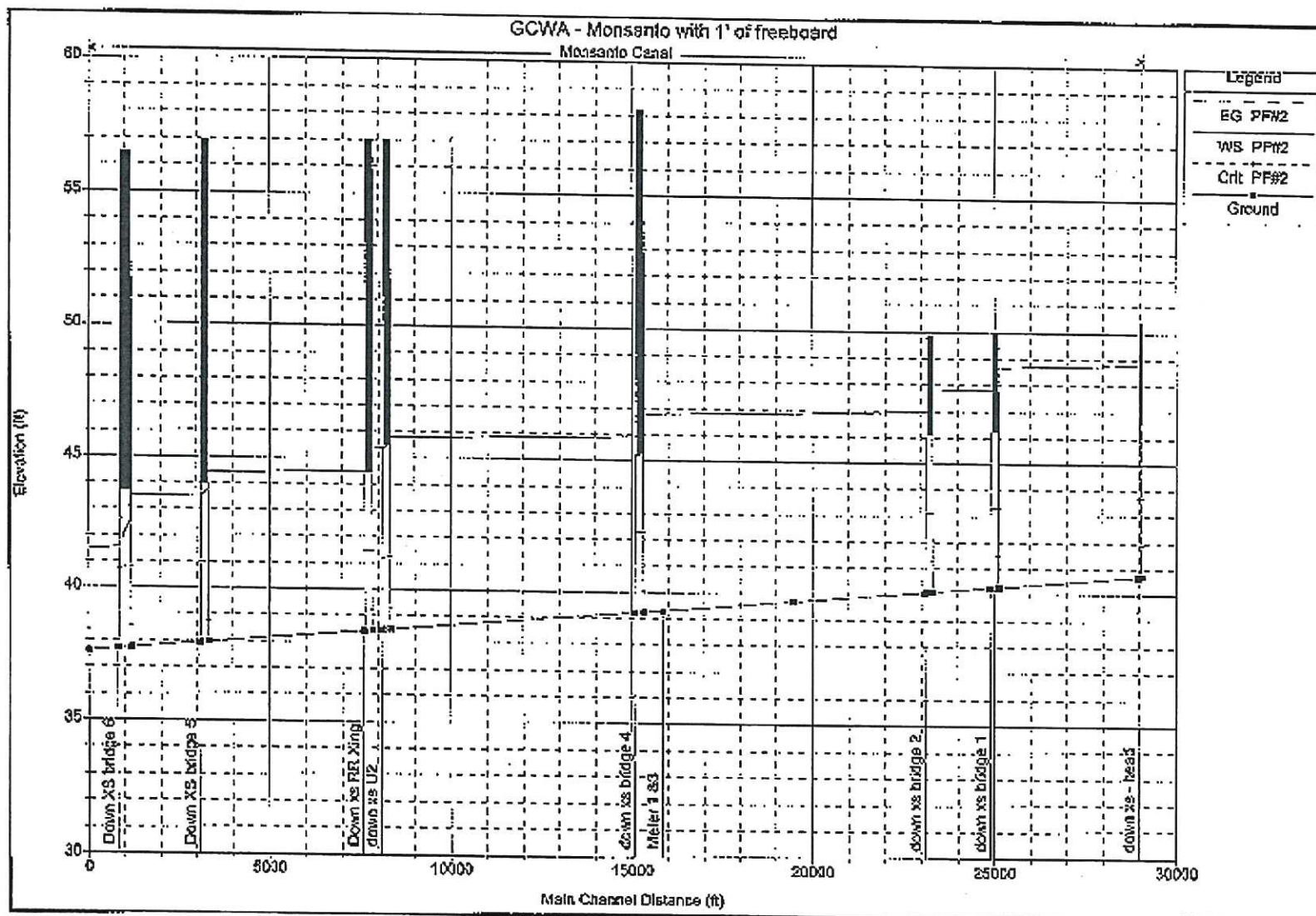


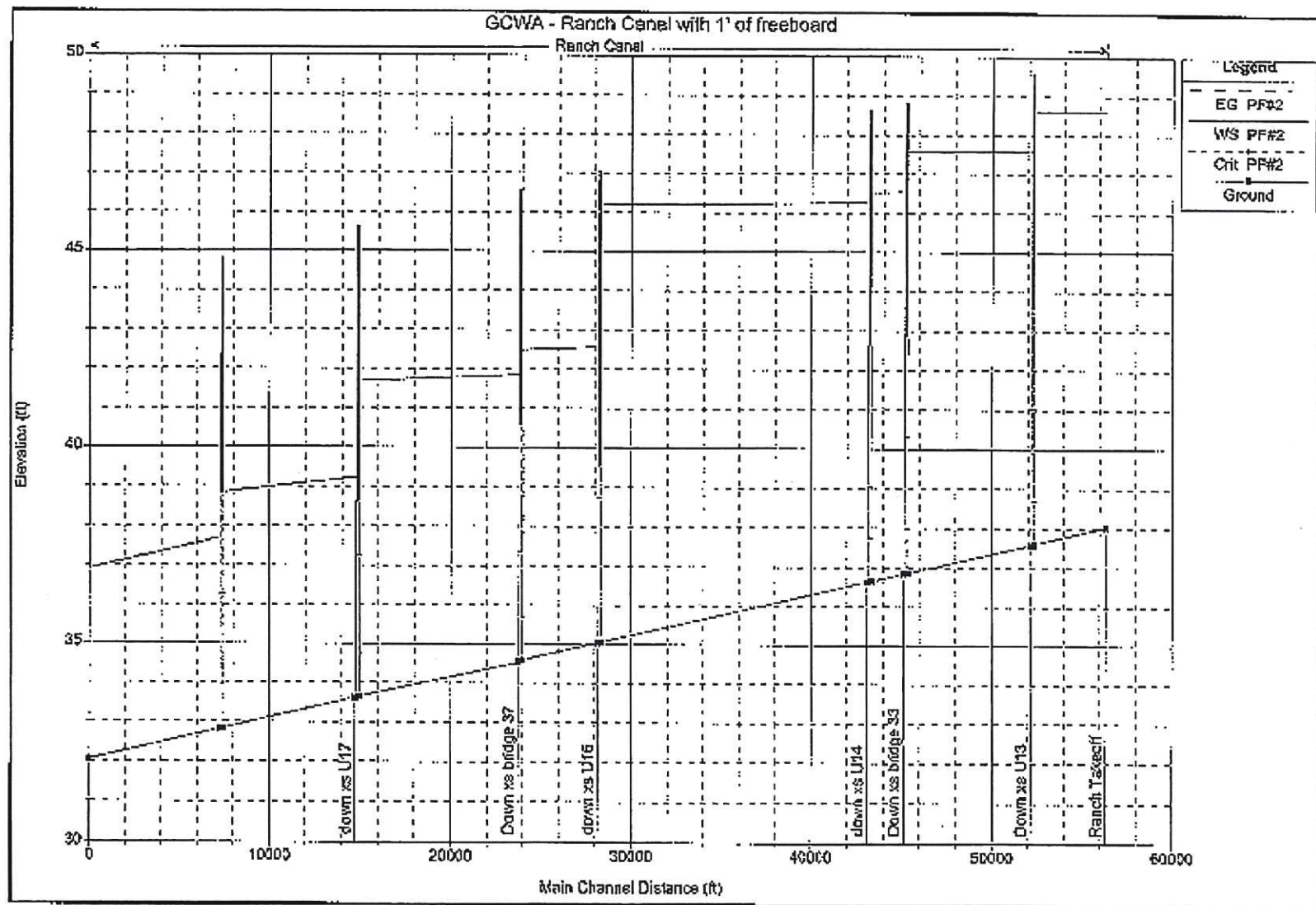


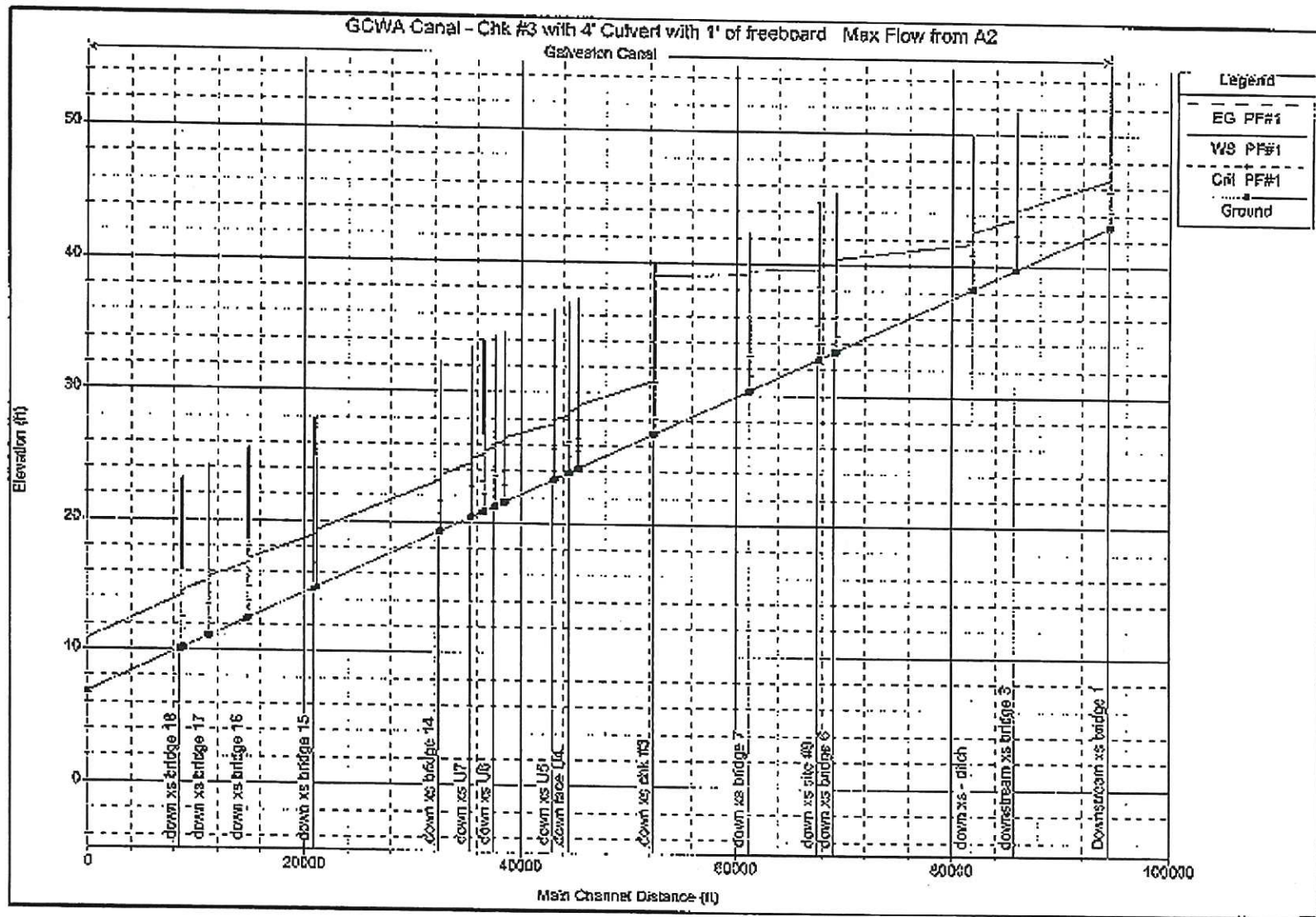




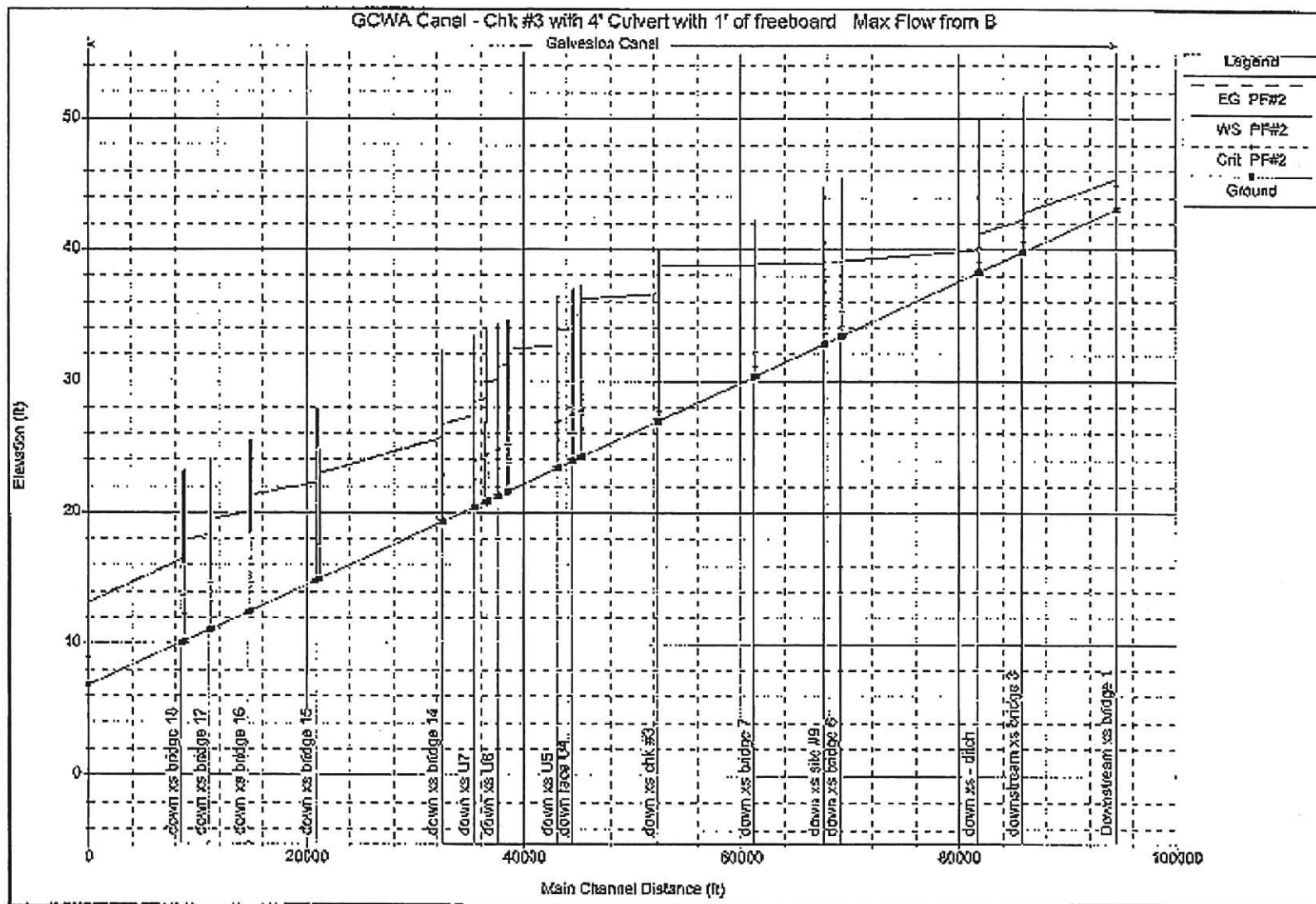


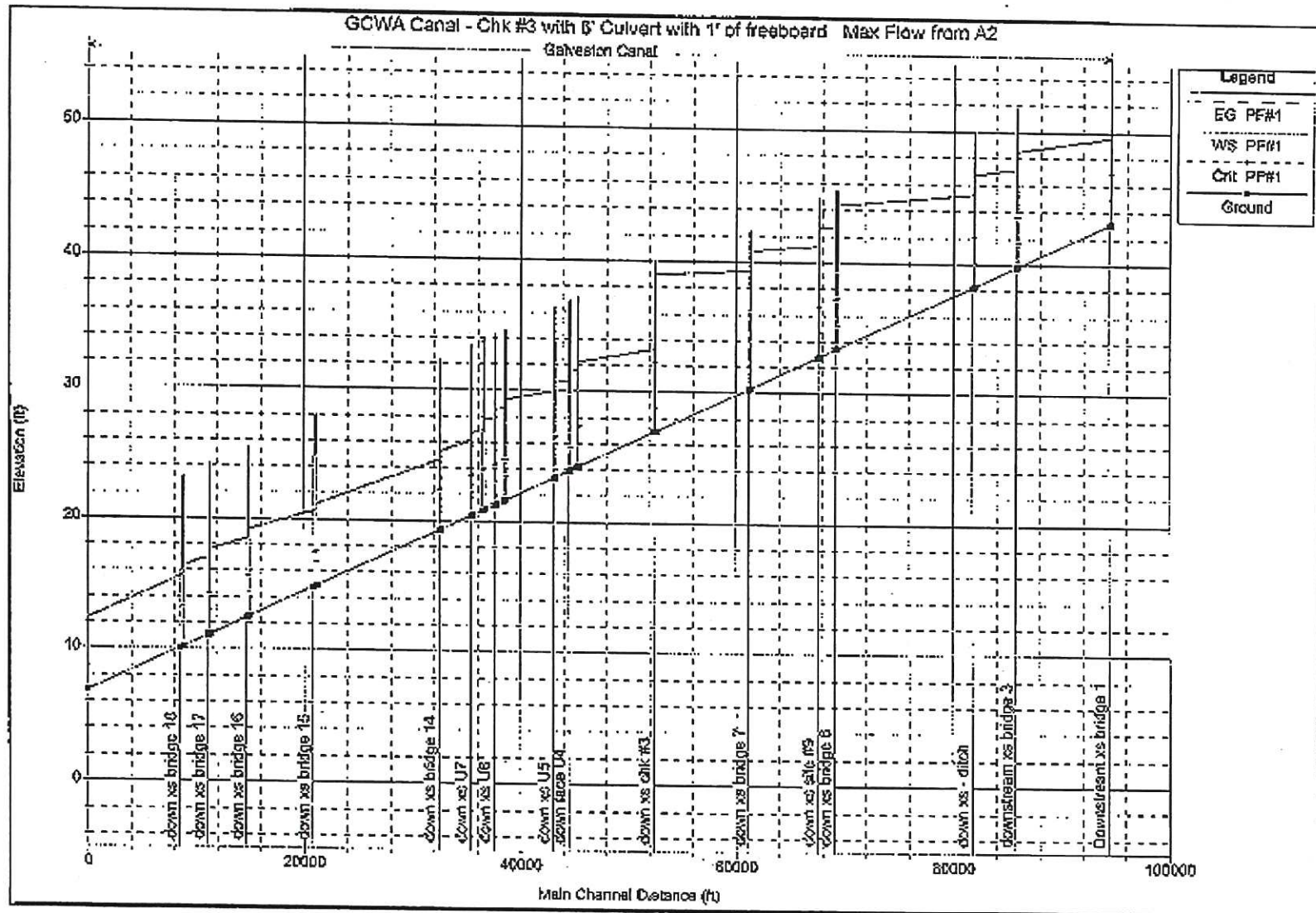




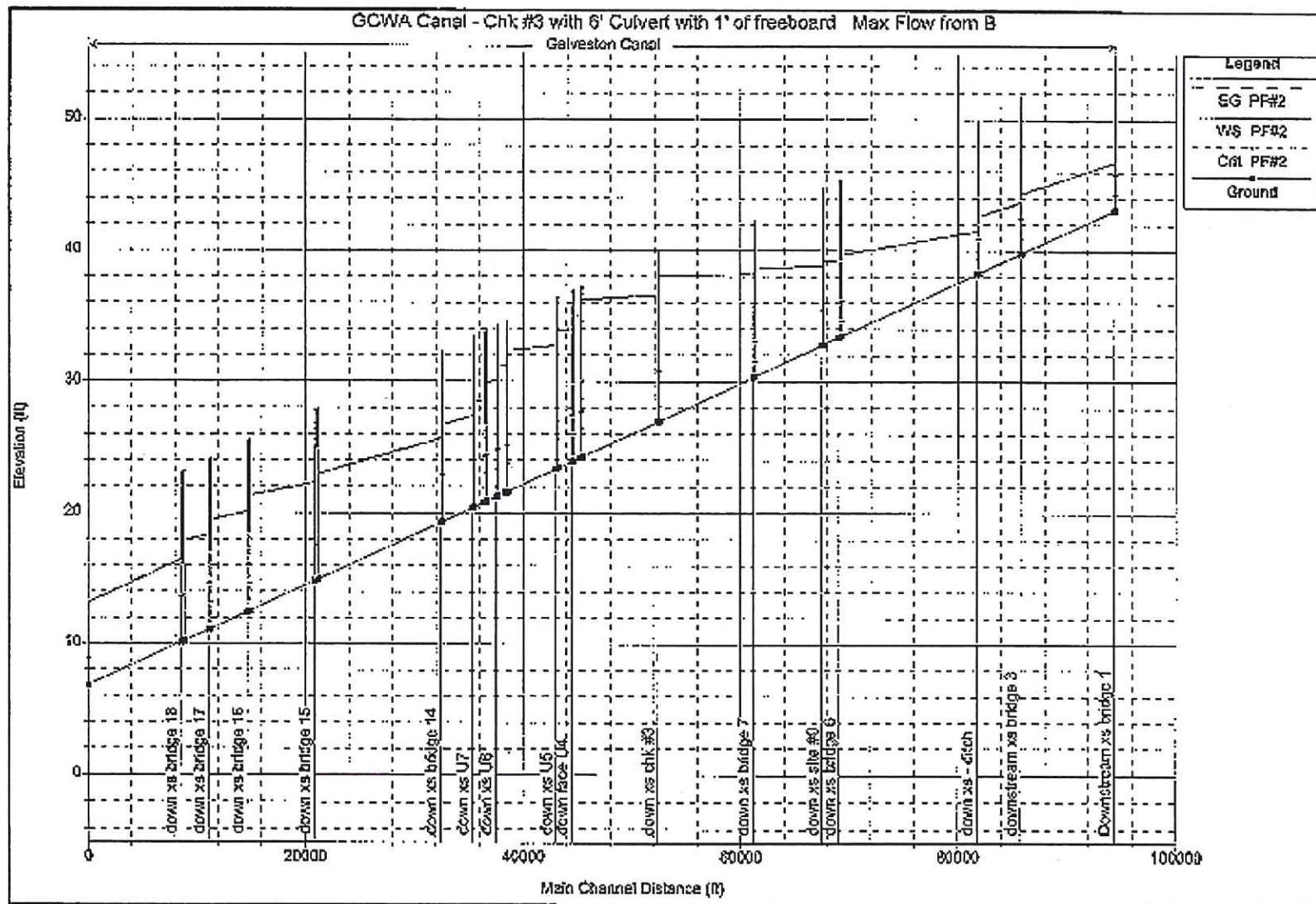


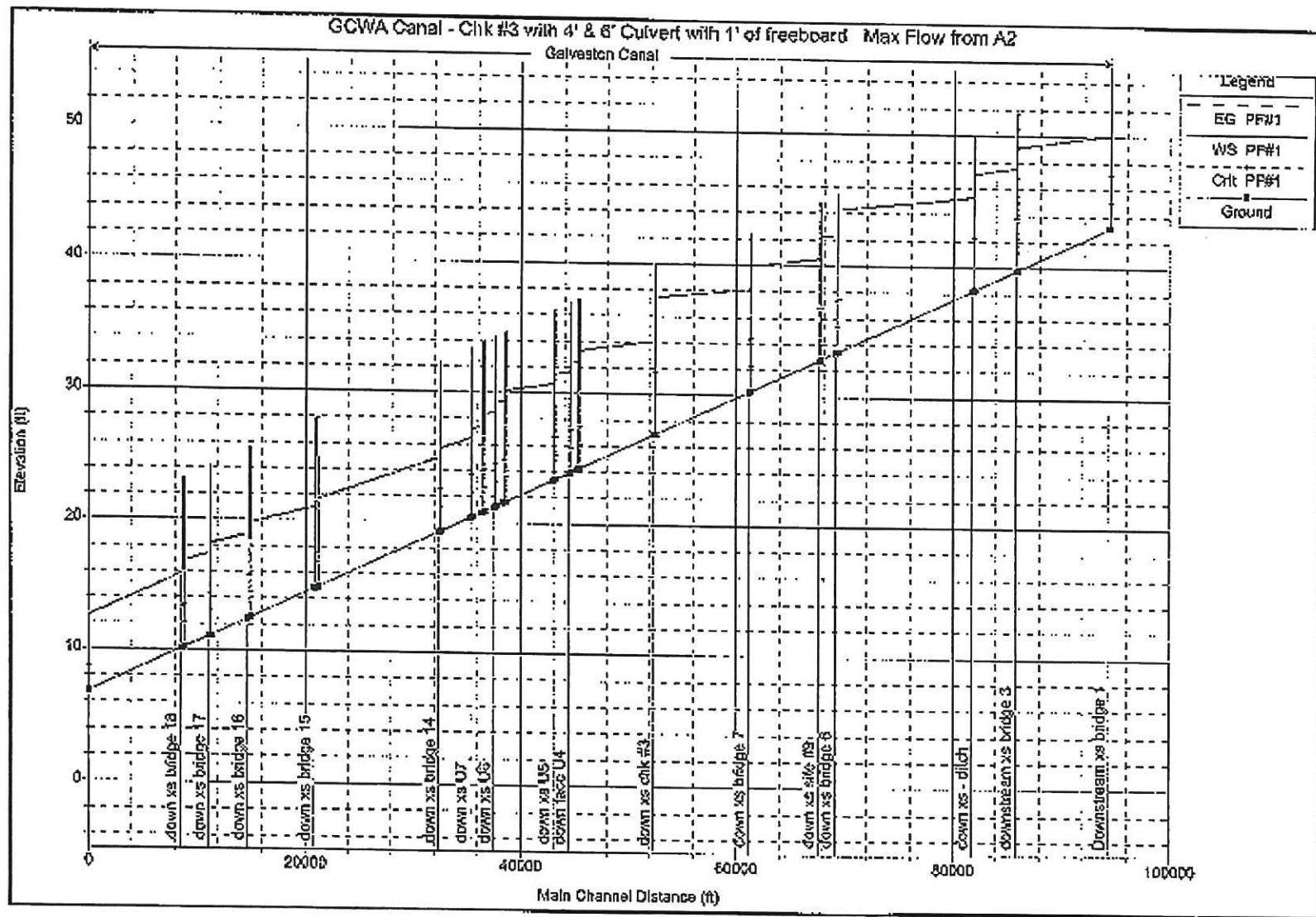


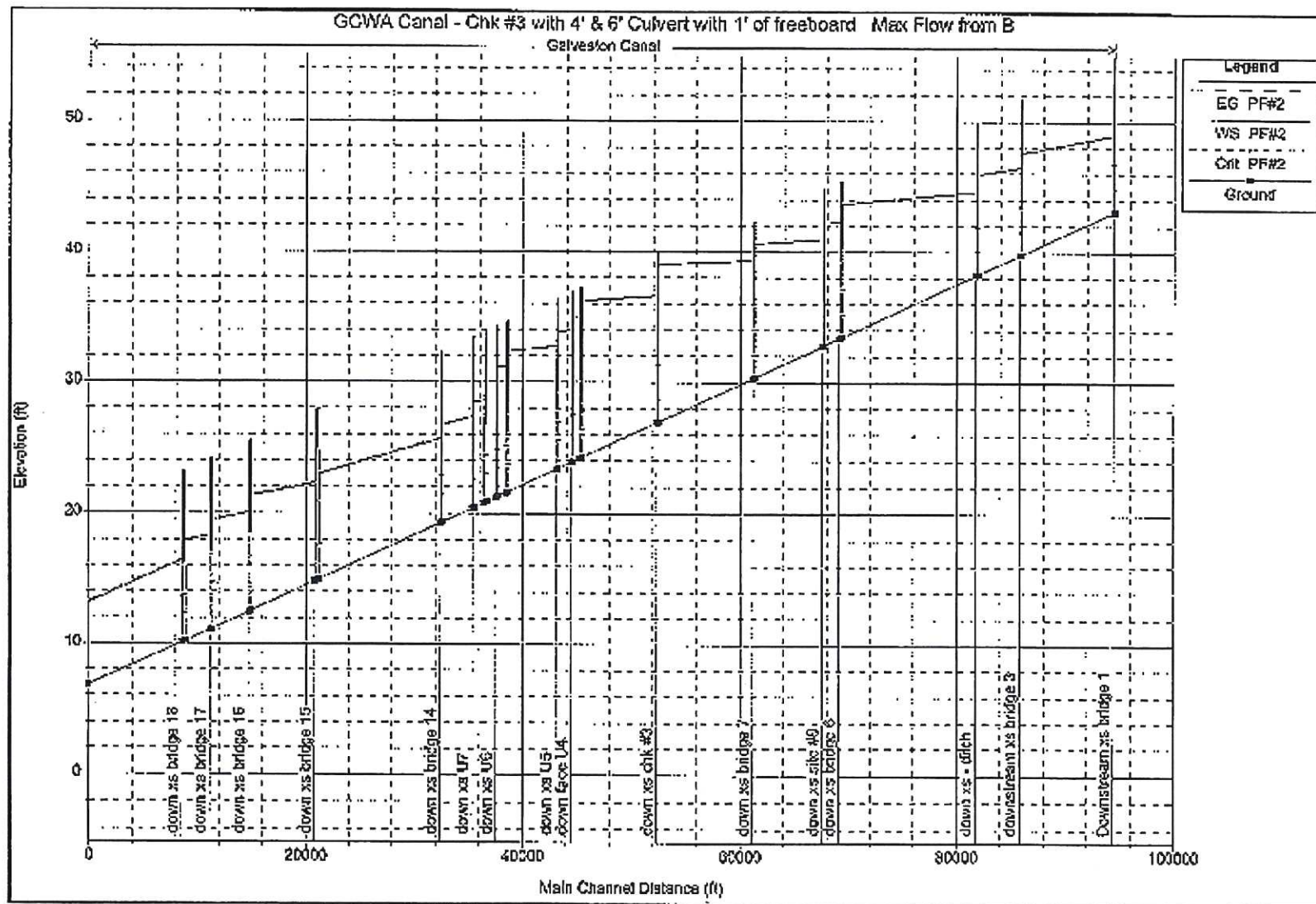




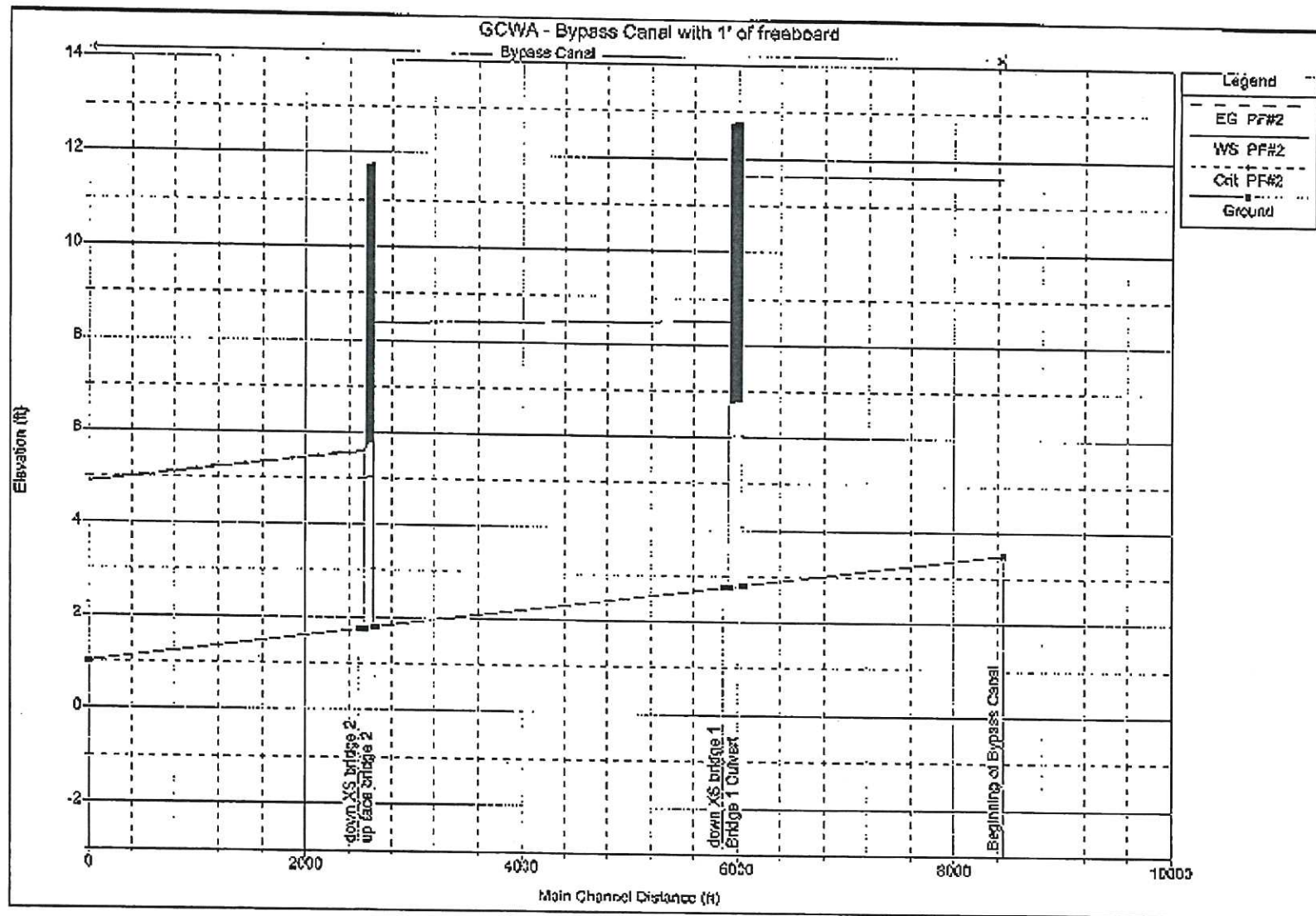












## **Appendix 10**

### **TWDB Water Use Survey**





Gulf Coast Water Authority

3630 FM 1765

Texas City, Texas 77591

409.935.2438

fax 409.935.4156 [www.gulfcoastwaterauthority.com](http://www.gulfcoastwaterauthority.com)

January 16, 2019

Texas Water Development Board – WUS Team  
P.O. Box 13231  
Austin, Texas 78711-3231

RE: Municipal Short Water Use Survey for End of Calendar Year December 31, 2017  
Survey Number: 1104566

To whom it may concern,

Please accept the attached Water Use Survey form from Gulf Coast Water Authority from the 2017 calendar year. We apologize for submitting this form after the March 1, 2018 deadline and we will ensure all future surveys will meet this deadline. Should you have any questions or concerns on the attached survey, please feel free to contact our Assistant District Engineer, Martin Balch, at [mbalch@gcwater.org](mailto:mbalch@gcwater.org) or by phone at (409) 502-4669.

Sincerely,

A handwritten signature in black ink, appearing to read "Ivan Langford", written in a cursive style.

Ivan Langford  
General Manager  
Gulf Coast Water Authority

## TEXAS WATER DEVELOPMENT BOARD

MUNICIPAL Short Water Use Survey for End of Calendar Year December 31, 2018<sup>2017</sup>

Deadline to return completed survey is March 1, 2019, according to Chapter 31 in Texas Administrative Code (TAC) Section 358.

Once complete, make a copy for your records.  
For guidance, refer to end notes on the last pages of the survey form. For assistance, call Water Use Survey hotline (512) 463-7952.

### CONTACT INFORMATION

As listed in previous correspondence; please note any revisions or changes to the contact information:

SURVEY Number<sup>1</sup>: 1104566 County: 84 GALVESTON

Name of System: Gulf Coast Water Authority TX City Community PWS Code<sup>2</sup>: 840153

Mailing Address: 3630 FM 1765

City/State: Texas City / TX Zip Code: 77591

Contact Name: Martin Balch , PE Title: Assistant District Engineer

Email Address: mbalch@gcwater.org Telephone Number: (409) 502-4669

Please provide any additional comments or remarks below.

Please return completed survey to TWDB Water Use Survey (WUS) Team:

Email [waterusesurvey@twdb.texas.gov](mailto:waterusesurvey@twdb.texas.gov) OR Fax (512) 463-8468 OR

Mail to TWDB-WUS Team at P.O. Box 13231 Austin, Texas 78711-3231

Survey Number 1104566

System Name Gulf Coast Water Authority TX City

### Pumped Groundwater (Self-Supplied)<sup>3</sup>

Did this system pump groundwater last year?

Yes ☐ No ☒

If no, go on to next page.

### Volume of Water Intake in Gallons

Please provide the Intake information and volumes (in GALLONS) below for each Aquifer/County group of wells. If groundwater is pumped from more than 3 Aquifer/County combinations, please include a copy of this page with the additional groundwater sources. *Total volume automatically calculates.*

GROUNDWATER	Source 1	Source 2	Source 3
Aquifer from which groundwater was pumped	_____	_____	_____
County where groundwater was pumped	_____	_____	_____
Number of active wells			
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
TOTAL VOLUME gallons	0	0	0
Metered or Estimated <sup>4</sup>	_____	_____	_____
Percent of Volume Treated Before Intake <sup>5</sup>	%	%	%
Brackish/Saline <sup>6</sup>	_____	_____	_____

1 acre-foot = 325,851 gallons; 1 barrel = 42 gallons; 1 cubic foot = 7.48 gallons

Survey Number 1104566

System Name Gulf Coast Water Authority TX City

Surface Water under a TCEQ Water Right (Self-Supplied)<sup>7</sup>

Did this system pump surface water under a TCEQ Surface Water Right last year? Yes ☒ No ☐  
If no, go on to next page.

Volume of Water Intake in Gallons

Please provide the Intake information and volumes (in **GALLONS**) below for each Surface Water source OR for each TCEQ Surface Water Right. (Multiple Water Rights from a single surface water source can be combined in reporting or reported separately.) If surface water is diverted from more than 3 surface water sources or from more than 3 Water Rights, please include a copy of this page with the additional surface water sources.

Total volume automatically calculates.

SURFACE WATER	Source 1	Source 2	Source 3
Source River or Reservoir Name	Brazos River	Brazos River	Brazos River
County where diversion took place	79 FORT BEND	79 FORT BEND	79 FORT BEND
TCEQ Surface Water Right Number(s)	5322	5171	5168
January	0	2,695,582,900	272,064,400
February	4,900	2,529,576,000	289,214,800
March	129,564,400	2,360,088,900	353,253,900
April	845,329,100	2,689,785,100	941,316,400
May	3,058,403,400	4,077,636,700	965,793,000
June	2,960,560,500	3,856,069,400	1,107,203,100
July	2,074,066,400	3,215,072,200	1,512,300,800
August	1,124,912,100	2,565,694,900	1,039,406,900
September	839,780,600	1,489,971,100	1,651,947,300
October	219,508,000	519,619,400	1,647,057,400
November	134,000	3,133,392,900	393,110,900
December	0	2,358,370,600	247,500,900
TOTAL VOLUME gallons	11,252,263,400	31,490,860,100	10,420,169,800
Metered or Estimated <sup>8</sup>	Metered	Metered	Metered
Percent of Volume Treated Before Intake <sup>9</sup>	0 %	0 %	0 %
Brackish/Saline <sup>10</sup>	No	No	No
Percent Consumed <sup>11</sup>	100 %	100 %	100 %

1 acre-foot = 325,851 gallons; 1 barrel = 42 gallons; 1 cubic foot = 7.48 gallons



Survey Number 1104566

System Name Gulf Coast Water Authority TX City

Surface Water under a TCEQ Water Right (Self-Supplied)<sup>7</sup>

Did this system pump surface water under a TCEQ Surface Water Right last year? Yes ☒ No ☐  
If no, go on to next page.

Volume of Water Intake in Gallons

Please provide the Intake information and volumes (in **GALLONS**) below for each Surface Water source OR for each TCEQ Surface Water Right. (Multiple Water Rights from a single surface water source can be combined in reporting or reported separately.) If surface water is diverted from more than 3 surface water sources or from more than 3 Water Rights, please include a copy of this page with the additional surface water sources.

Total volume automatically calculates.

SURFACE WATER	Source 1	Source 2	Source 3
Source River or Reservoir Name	Jones & Oyster Creek	Chocolate Bayou	
County where diversion took place	79 FORT BEND	20 BRAZORIA	
TCEQ Surface Water Right Number(s)	5169	5357	
January	107,981,709	0	
February	29,161,864	0	
March	53,406,131	40,763,960	
April	328,181,057	144,351,993	
May	237,882,466	254,646,040	
June	560,200,917	238,741,252	
July	516,957,626	147,418,251	
August	333,110,378	37,336,008	
September	574,403,935	111,108,674	
October	342,403,791	126,687,610	
November	291,799,381	0	
December	170,163,452	0	
TOTAL VOLUME gallons	3,545,652,707	1,101,053,788	0
Metered or Estimated <sup>8</sup>	Metered	Metered	
Percent of Volume Treated Before Intake <sup>9</sup>	0 %	0 %	%
Brackish/Saline <sup>10</sup>	No	No	
Percent Consumed <sup>11</sup>	100 %	100 %	%

1 acre-foot = 325,851 gallons; 1 barrel = 42 gallons; 1 cubic foot = 7.48 gallons



Survey Number 1104566

System Name Gulf Coast Water Authority TX City

### Purchased Water

Did this system purchase ground or surface water last year?

Yes ☐ No ☒

If no, go on to next page.

### Volume of Water Intake in Gallons

Please provide the Intake information and volumes (in **GALLONS**) below for water purchased. If water is purchased from more than 3 water providers, please include a copy of this page with the additional water purchases. If water is purchased from a provider and metered through more than one connection, then combine the metered volumes in reporting the purchase below.

*Total volume automatically calculates.*

PURCHASED GW/SW	Source 1	Source 2	Source 3
Name of Water Provider			
Type of water <sup>12</sup> if known			
Name of Source <sup>13</sup> if known			
Source County			
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
TOTAL VOLUME gallons	0	0	0
Metered or Estimated <sup>14</sup>			
Percent of Volume Treated Before Intake <sup>15</sup>	%	%	%
Brackish/Saline <sup>16</sup>			

1 acre-foot = 325,851 gallons; 1 barrel = 42 gallons; 1 cubic foot = 7.48 gallons

Survey Number 1104566

System Name Gulf Coast Water Authority TX City

Reuse \ Treated Effluent (Self-Supplied or Purchased)

Did this system reuse treated effluent water last year?

Yes ☐ No ☒

If no, go on to next page.

Please enter the annual volume of waste-water effluent that was treated by the system with the purpose of reuse. Complete a column for each unique reuse water source. Please note that percentage(s) must total 100%.

REUSE	Source 1	Source 2	Source 3
Name of Water Source <sup>17</sup>	_____	Raw	Raw
Treatment County <sup>18</sup>	_____	_____	_____
If purchased, Seller <sup>19</sup>	_____	_____	_____
Direct or Indirect <sup>20</sup>	_____	_____	_____
If Indirect, TCEQ Surface Water Right Number <sup>21</sup>	_____	_____	_____
TOTAL VOLUME gallons <sup>22</sup>	_____	_____	_____
% Used for Industrial <sup>23</sup>	_____ %	_____ %	_____ %
% Used for Landscape <sup>24</sup>	_____ %	_____ %	_____ %
% Used for Agriculture <sup>25</sup>	_____ %	_____ %	_____ %
% Used for Other <sup>26</sup>	_____ %	_____ %	_____ %

1 acre-foot = 325,851 gallons; 1 barrel = 42 gallons; 1 cubic foot = 7.48 gallons

Survey Number 1104566

System Name Gulf Coast Water Authority TX City

### Water Sales to other Water Systems or Industrial Facilities

Did this system sell water to another water system or industry last year? Yes ☒ No ☐

If no, go on to next page.

### Wholesale Water Sales to other Water Systems

If the system sells water to other public water systems, please complete the row for each sale. If system has more than 3 sales, please include a copy of this page with the additional sales.

WATER SYSTEM SALES	Buyer Name	Water Type <sup>27</sup> (GW,SW,CS)	Source Name <sup>28</sup>	Source County	Raw or Treated	TOTAL VOLUME (Gallons) <sup>29</sup>
Sale 1	Mackey WTP	SW	Brazos River	79 FORT BEND	Raw	10881605567
Sale 2	City of Missouri City	SW	Brazos River	79 FORT BEND	Raw	2168531264
Sale 3	Fort Bend WCID #2	SW	Brazos River	79 FORT BEND	Raw	854797533

### Water Sales to Industrial Production Facilities<sup>30</sup>

If the system sells water to industrial facilities (mining, manufacturing, or power generation), please complete the row for each sale. If system has more than 3 sales, please include a copy of this page with the additional sales. If volume sold is less than 10 million gallons, then combine industry sale volumes.

INDUSTRY SALES	Buyer Name <sup>31</sup>	Water Type <sup>32</sup> (GW,SW,CS)	Source Name <sup>33</sup>	Source County	Raw or Treated	TOTAL VOLUME (Gallons) <sup>34</sup>
Sale 1	Texas City Industry	SW	Brazos River	79 FORT BEND	Raw	15409824941
Sale 2	Ashland	SW	Brazos River	79 FORT BEND	Raw	337812819
Sale 3	Texas Brine	SW	Brazos River	79 FORT BEND	Raw	228166469

Survey Number 1104566

System Name Gulf Coast Water Authority TX City

### Water Sales to other Water Systems or Industrial Facilities

Did this system sale water to another water system or industry last year? Yes ☒ No ☐

If no, go on to next page.

### Wholesale Water Sales to other Water Systems

If the system sells water to other public water systems, please complete the row for each sale. If system has more than 3 sales, please include a copy of this page with the additional sales.

WATER SYSTEM SALES	Buyer Name	Water Type <sup>27</sup> (GW,SW,CS)	Source Name <sup>28</sup>	Source County	Raw or Treated	TOTAL VOLUME (Gallons) <sup>29</sup>
Sale 1	Pecan Grove	SW	Brazos River	79 FORT BEND	Raw	592077547
Sale 2	City of Sugarland	SW	Brazos River	79 FORT BEND	Raw	2775030000
Sale 3						

### Water Sales to Industrial Production Facilities<sup>30</sup>

If the system sells water to industrial facilities (mining, manufacturing, or power generation), please complete the row for each sale. If system has more than 3 sales, please include a copy of this page with the additional sales. If volume sold is less than 10 million gallons, then combine industry sale volumes.

INDUSTRY SALES	Buyer Name <sup>31</sup>	Water Type <sup>32</sup> (GW,SW,CS)	Source Name <sup>33</sup>	Source County	Raw or Treated	TOTAL VOLUME (Gallons) <sup>34</sup>
Sale 1	Ascend	SW	Chocolate Bayou	20 BRAZORIA	Raw	3118331449
Sale 2	INEOS	SW	Chocolate Bayou	20 BRAZORIA	Raw	4100153504
Sale 3						



Survey Number 1104566

System Name Gulf Coast Water Authority TX City

## Water System Information

What is the retail total population<sup>35</sup> served directly by this system?

440,869

Please provide any additional comments or remarks below.

<sup>1</sup> The survey number is a unique number assigned by Texas Water Development Board (TWDB) to each system. Survey number does not change. This number can be found in the upper-right header on the notification letter that is sent to all systems every year.

<sup>2</sup> The public water supply (PWS) Code number is a unique number assigned by the Texas Commission on Environmental Quality to each public water system in Texas.

<sup>3</sup> If the system pumps groundwater, please provide those volumes in gallons by aquifer. If your system is able to provide volumes by individual wells, please use our Online data-entry application located at, <http://www.twdb.state.tx.us/waterplanning/waterusesurvey/survey/online.asp>.

<sup>4</sup> Was the pumped groundwater volume either Metered or Estimated? Select either "Metered" or "Estimated".

<sup>5</sup> What percent of the volume was treated prior to intake? May include raw water purchases (0% treated), treated water purchases (100%), or a combination.

<sup>6</sup> Was the water brackish or saline (seawater) prior to treatment? Brackish water is between 1,000 and 10,000 milligrams per liter (mg/L) of total dissolved solids (TDS). Saline water is considered water having greater than 10,000 mg/L of TDS. Select either "Yes" if brackish/saline, or "No" if not brackish/saline.

<sup>7</sup> If the system diverts or receives surface water from an owned or contracted Texas Commission on Environmental Quality (TCEQ) water right, please provide those diverted volumes that enter the system. The monthly diversion volumes for each water right must be included here, in addition to the reported required by TCEQ or Water-master office.

<sup>8</sup> Was the surface water volume diverted either Metered or Estimated? Select either "Metered" or "Estimated".

<sup>9</sup> What percent of the volume was treated prior to intake? May include raw water purchases (0% treated), treated water purchases (100%), or a combination.



- <sup>10</sup> Was the water brackish or saline (seawater) prior to treatment? Brackish water is between 1,000 and 10,000 milligrams per liter (mg/L) of total dissolved solids (TDS). Saline water is considered water having greater than 10,000 mg/L of TDS. Select either "Yes" if brackish/saline, or "No" if not brackish/saline.
- <sup>11</sup> If surface water was used in an industrial process, such as once-through cooling, where a significant portion of the water was returned to the original water source with minimal treatment; enter what PERCENT of the diverted volume was consumed.
- <sup>12</sup> Select the type of water purchased: Groundwater, Surface Water or Combined Source (ground and surface water).
- <sup>13</sup> If ground water, please enter the aquifer name; if surface water, enter the river or reservoir name.
- <sup>14</sup> Was the purchased water volume either Metered or Estimated? Select either "Metered" or "Estimated".
- <sup>15</sup> What percent of the volume was treated prior to intake? May include raw water purchases (0% treated), treated water purchases (100%), or a combination.
- <sup>16</sup> Was the water brackish or saline (seawater) prior to treatment? Brackish water is between 1,000 and 10,000 milligrams per liter (mg/L) of total dissolved solids (TDS). Saline water is considered water having greater than 10,000 mg/L of TDS. Select either "Yes" if brackish/saline, or "No" if not brackish/saline.
- <sup>17</sup> What is the name of the water source prior to water use and treatment?
- <sup>18</sup> In which county was the effluent treated for reuse?
- <sup>19</sup> If the reuse water was purchased, what is the Seller's name?
- <sup>20</sup> Direct reuse is the use of reclaimed water that is piped directly from the wastewater treatment plant to the place where it is used. Indirect reuse is the use of reclaimed water by discharging to a water supply source, such as surface water or groundwater, where it blends with the water supply and may be further purified before being removed for non-potable or potable uses.
- <sup>21</sup> If Indirect reuse water is blended with a surface water source, what is the TCEQ Surface Water Right or Adjudication number?
- <sup>22</sup> Total annual reuse water volume in gallons.
- <sup>23</sup> Industrial reuse - the reuse of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, and the development of power by means other than hydroelectric, but does not include agricultural use. (Examples: mining, construction, and manufacturing).
- <sup>24</sup> Landscape reuse - the reuse of water on turf and plant areas including decorative water features comprising a landscape. Landscape reuse includes the irrigation of golf courses and parks if the water is from a public water system.
- <sup>25</sup> Agricultural reuse - any reuse of water for agriculture purposes such as crop production, livestock, wildlife management, forestry, or horticulture.
- <sup>26</sup> Other reuse - the reuse of water that is not for landscape, agricultural, or industrial purposes.
- <sup>27</sup> Where GW is Ground Water, SW is Surface Water, and CS is Combined Source (ground water and surface water).
- <sup>28</sup> If ground water, please enter the aquifer name; if surface water, enter the river or reservoir name.
- <sup>29</sup> Please enter the Total Volume sold in gallons.
- <sup>30</sup> Please list the buyers only when the volumes are greater than 10 million gallons. These should be sales to production facilities, not administrative offices. If sold to a significant number of MINING or MANUFACTURING facilities where each sale is less than 10 million gallons, please sum the sales together and list as "Other Mining" or "Other Manufacturing".
- <sup>31</sup> Enter name of each Industrial Customer.
- <sup>32</sup> Where GW is Ground Water, SW is Surface Water, and CS is Combined Source (ground water and surface water).
- <sup>33</sup> If ground water, please enter the aquifer name; if surface water, enter the river or reservoir name.
- <sup>34</sup> Please enter the Total Annual Volume for each sale in gallons.
- <sup>35</sup> Population refers to any persons as students, customers, residents, employees, institutionalized convicts, members of a congregation, etc. Basically the annual population is an approximate estimation of the amount of people that have consumed water within your system's distribution.

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

December 27, 2018

Mr. Ivan Langford  
Gulf Coast Water Authority  
3630 FM 1765  
Texas City, Texas 77591-4824

**CERTIFIED MAIL**

9489 0090 0027 6009 3696 25

RE: Gulf Coast Water Authority  
ADJ 5322  
CN600566152, RN104059472  
Application No. 12-5322G to Amend Certificate of Adjudication No. 12-5322  
Texas Water Code §§ 11.122, 11.085, 11.042, Requiring Limited & Full Basin  
Mailed and Published Notice  
Brazos River, Brazos River Basin  
Fort Bend County

Dear Mr. Langford:

This acknowledges receipt, on October 26, 2018, of the referenced application and partial fees in the amount of \$225 (Receipt No. M903112, copy enclosed).

Additional information and fees are required before the application can be declared administratively complete.

1. Revise Page 3 of the Technical Information Report to reflect that this application is submitted under TWC 11.042(c). Staff notes that the water requested for conveyance in the bed and banks of Jones and Oyster Creeks is run-of-the-river water, not stored or conserved water.
2. Confirm the locations of the 6 diversion points comprising the upstream and downstream limits of the three diversion reaches. The coordinates indicated on the maps in Attachment 1 are not consistent with the coordinates provided in Worksheets 3.0.
3. Provide the following information in support of the request to authorize the bed and banks of Jones Creek and Oyster Creek to convey water, or, in the alternative, provide evidence showing that use of the bed and banks of Jones Creek and Oyster Creek is already authorized.
  - a) Provide a completed Worksheet 3.0 for the diversion point at the end-point of the 42-mile conveyance reach. Staff notes that the discharge point identified in Worksheet 4.1 is the beginning point of the reach.

- b) Provide the study documenting the method used to calculate the 20% conveyance loss value for the requested bed and banks reach, as described in Worksheet 4.0, item b.
- c) Provide a completed Worksheet 5.0, section 2, including measures to avoid impingement and entrainment of aquatic organisms, an assessment of the quantity and quality of flows remaining after the proposed diversion to meet instream uses and bay and estuary freshwater inflow requirements, and water quality information for the conveyed water. Water chemistry information should include, but not be limited to, the following parameters: chlorides, sulfates, total dissolved solids, pH, and temperature.
4. Explain the responses in Worksheet 4.0, items ci and cii. Based on Staff's understanding of the application, the water to be conveyed under the requested bed and banks authorization is run-of-river water authorized under Certificate of Adjudication Nos. 12-5168, 12-5171, and 12-5322, as amended. The response to item ci indicates the source of the water to be conveyed to be water originating from a surface water contract. The response in item cii indicates that other alternate sources will be discharged for conveyance in the bed and banks of Jones and Oyster Creeks. If the application requests water that is not authorized under Certificate of Adjudication Nos. 12-5168, 12-5171 and 12-5322, provide detailed information on those alternate sources and contracts.
5. Remit fees in the amount of \$889.54 as described below. Please make check payable to the Texas Commission on Environmental Quality or the TCEQ.

Filing Fee(Amendment)	\$ 100.00
Recording Fee	\$ 12.50
Notice Fee (Brazos River Basin)	\$ 997.34
Notice Fee (\$0.94 x 5 water right holders; San Jacinto-Brazos Coastal Basin)	\$ 4.70
Total Fees	\$ 1,114.54
Fees Received	\$ 225.00
Fees Due	\$ 889.54

Please provide the requested information and fees by January 28, 2019, or the application may be returned pursuant to 30 TAC § 281.18.

Note that as of December 27, 2018, one or more of the Texas Water Development Board's (TWDB) Water Use Surveys have not been received and/or declared administratively complete by the TWDB.

Texas Water Code (TWC) §16.012(m) states: "...A person who fails to timely complete and return the survey is not eligible for funding from the board for board programs and is ineligible to obtain permits, permit amendments, or permit renewals from the commission under Chapter 11..." Copies of TWC § 16.012 and 30 TAC § 297.41 are enclosed for your reference.

Mr. Ivan Langford  
Application No. 12-5322G  
December 27, 2018  
Page 3 of 3

Please be aware that the amendment to Certificate of Adjudication No. 12-5322 will not be issued, if recommended for issuance, until the TWDB's 2017 Water Use Survey is returned and declared administratively complete by the TWDB.

If you have any questions concerning the Water Use Survey, please contact Bill Billingsley of the TWDB at (512) 936-0885. If you have any questions concerning the amendment application, please contact me via email at [humberto.galvan@tceq.texas.gov](mailto:humberto.galvan@tceq.texas.gov) or by telephone at (512) 239-4013.

Sincerely,



Bert Galvan, Work Leader  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section

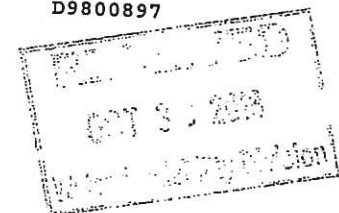
Enclosure



29-OCT-18 10:00 AM

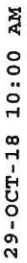
## TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

<u>Fee Description</u>	<u>Fee Code</u> <u>Account#</u> <u>Account Name</u>	<u>Ref#1</u> <u>Ref#2</u> <u>Paid In By</u>	<u>Check Number</u> <u>Card Auth.</u> <u>User Data</u>	<u>CC Type</u> <u>Tran Code</u> <u>Rec Code</u>	<u>Slip Key</u> <u>Document#</u>	<u>Tran Date</u>	<u>Tran Amount</u>
WTR USE PERMITS	WUP	M903110	69936				
	WUP	125168	102618	N	BS00069259	29-OCT-18	-\$225.00
	WATER USE PERMITS	GULF COAST	SPREDEAU	CK	D9800897		
		WATER					
		AUTHORITY					
	WUP	M903111	69937				
	WUP	125171	102618	N	BS00069259	29-OCT-18	-\$225.00
	WATER USE PERMITS	GULF COAST	SPREDEAU	CK	D9800897		
		WATER					
		AUTHORITY					
	WUP	M903112	69938				
	WUP	125322	102618	N	BS00069259	29-OCT-18	-\$225.00
	WATER USE PERMITS	GULF COAST	SPREDEAU	CK	D9800897		
		WATER					
		AUTHORITY					
	WUP	M903113	1170				
	WUP	ADJ232756	102618	N	BS00069259	29-OCT-18	-\$100.00
	WATER USE PERMITS	MANGLBERGER	SPREDEAU	CK	D9800897		
		, PATRICIA					
		ANN					
		(ESTATE)					









## TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

<u>Fee Code</u>	<u>Account#</u>	<u>Account Name</u>	<u>Ref#1</u>	<u>Ref#2</u>	<u>Check Number</u>	<u>CC Type</u>	<u>Slip Key</u>	<u>Tran Date</u>	<u>Tran Amount</u>
			<u>Paid In By</u>	<u>User Data</u>	<u>Card Auth.</u>	<u>Rec Code</u>	<u>Document#</u>		
WTR USE PERMITS	WUP		M903110	69936			BS00069259	29-OCT-18	- \$225.00
	WUP		125168	102618		N	D9800897		
	WATER USE PERMITS		GULF COAST	SPREDEAU		CK			
			WATER						
			AUTHORITY						
	WUP		M903111	69937			BS00069259	29-OCT-18	- \$225.00
	WUP		125171	102618		N	D9800897		
	WATER USE PERMITS		GULF COAST	SPREDEAU		CK			
			WATER						
			AUTHORITY						
	WUP		M903112	69938			BS00069259	29-OCT-18	- \$225.00
	WUP		125322	102618		N	D9800897		
	WATER USE PERMITS		GULF COAST	SPREDEAU		CK			
			WATER						
			AUTHORITY						
	WUP		M903113	1170			BS00069259	29-OCT-18	- \$100.00
	WUP		ADJ232756	102618		N	D9800897		
	WATER USE PERMITS		MANGLBERGER	SPREDEAU		CK			
			, PATRICIA						
			ANN						
			(ESTATE)						

RECEIVED  
OCT 1 1983  
U.S. DEPARTMENT OF JUSTICE

# BAKER BOTTS LLP

98 SAN JACINTO BLVD.  
SUITE 1500  
AUSTIN, TEXAS  
78701-4078

TEL +1 512.322.2500  
FAX +1 512.322.2501  
BakerBotts.com

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NEW YORK  
PALO ALTO  
RIYADH  
SAN FRANCISCO  
WASHINGTON

October 26, 2018

Paulina Williams  
TEL: 5123222543  
FAX: 5123223643  
paulina.williams@bakerbotts.com

VIA MESSENGER

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
12100 Park 35 Circle  
Austin, Texas 78753

Re: Checks Associated with Amendments to Gulf Coast Water Authority's Water  
Rights: COA Nos. 12-5168; 12-5171; and 12-5322 and Related Accounting Plan

To Whom it May Concern:

Enclosed please find three checks for \$225.00 associated with Gulf Coast Water Authority's (CN600566152) amendment applications for each of the three above referenced Certificates of Adjudication. Please process the check and return a stamped copy to the courier for the packet that will be delivered to the Water Availability Division for filing today.

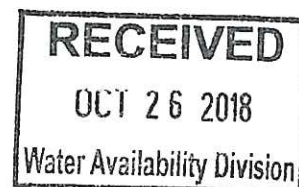
Please let me know if you have any questions.

Respectfully,



Paulina Williams

Enclosure



See binder for copy of original application  
with thirteen attachments

Received 10/26/2018

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322F

TYPE: §§11.122 & 11.085

Owner:	Gulf Coast Water Authority	Address:	3630 Highway 1765 Texas City, Texas 77591
Filed:	March 10, 2010	Granted:	<b>MAR 30 2010</b>
Purpose:	Municipal, Industrial, and Agricultural	Counties:	Brazoria and Fort Bend Counties
Watercourse:	Brazos River	Watershed:	Brazos River Basin and San Jacinto-Brazos Coastal Basin

WHEREAS, Gulf Coast Water Authority (Owner) is authorized to divert and use not to exceed 155,000 acre-feet of water per year at a maximum combined diversion rate of 900 cfs (405,000 gpm) from the Brazos River, Brazos River Basin, at a point in the William Pettus Grant, Abstract No. 68 in Fort Bend County, for municipal, industrial, and agricultural (irrigation) purposes within the Owner's service area in Fort Bend, Brazoria, and Harris Counties in the Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin pursuant to an exempt interbasin transfer; and

WHEREAS, Owner is also authorized to maintain three off-channel reservoirs known as Juliff, Bonney, and Liverpool Reservoirs in Fort Bend and Brazoria Counties and impound therein a combined maximum of 864 acre-feet of water for industrial purposes and subsequent agricultural (irrigation) purposes; and

WHEREAS, multiple time priorities apply; and

WHEREAS, Special Condition 5.B. of Certificate of Adjudication No. 12-5322, as amended, authorizes Owner to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural (irrigation) and industrial purposes in that coastal basin; and

WHEREAS, Owner seeks to amend Certificate of Adjudication No. 12-5322 to authorize exempt interbasin transfer of Brazos River Basin contract water from the Brazos River Basin to the adjoining San Jacinto-Brazos Coastal Basin for agricultural (irrigation) purposes in that coastal basin; and

WHEREAS, no increase in the diversion amount or the diversion rate is being requested; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, no requests for a contested case hearing were received for this application; and



WHEREAS, Application No. 12-5322E by Gulf Coast Water Authority to amend Certificate of Adjudication No. 12-5322 is pending; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality Commission in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322F, is issued to the Gulf Coast Water Authority, subject to the following terms and conditions:

1. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

2. SPECIAL CONDITIONS

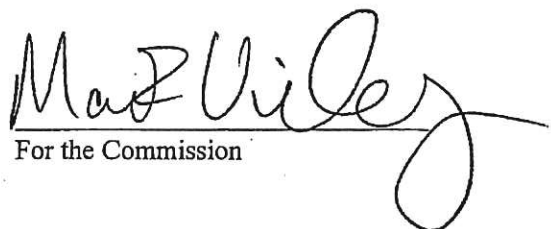
In addition to the existing authorizations in Special Condition 5.B. of Certificate of Adjudication No. 12-5322, as amended, Owner is authorized an exempt interbasin transfer of Brazos River Basin contract water from the Brazos River Basin to the adjoining San Jacinto-Brazos Coastal Basin for agricultural purposes in that coastal basin.

This amendment is issued subject to all terms, conditions, and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

  
For the Commission

ISSUED: **MAR 30 2010**

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322E

TYPE: §§11.122 & 11.085

Owner:	Gulf Coast Water Authority	Address:	3630 Highway 1765 Texas City, Texas 77591
Filed:	August 24, 2006	Granted:	January 7, 2011
Purpose:	Municipal, Industrial, and Agricultural (Irrigation)	Counties:	Fort Bend, Brazoria, Harris, and Galveston
Watercourse:	Brazos River	Watershed:	Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin

WHEREAS, Gulf Coast Water Authority (Owner or Applicant), is authorized to divert and use not to exceed 155,000 acre-feet of water per year a maximum combined diversion rate of 900 cfs (405,000 gpm) from the Brazos River, Brazos River Basin, at a point in the William Pettus Grant, Abstract No. 68 in Fort Bend County, for municipal, industrial, and agricultural (irrigation) purposes within the Owner's service area in Fort Bend, Brazoria, and Harris Counties in the Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin pursuant to an exempt interbasin transfer; and

WHEREAS, Owner is also authorized to maintain three off-channel reservoirs known as Juliff, Bonney, and Liverpool Reservoirs in Fort Bend and Brazoria Counties and impound therein a combined maximum of 864 acre-feet of water for industrial purposes and subsequent agricultural (irrigation) purposes; and

WHEREAS, Owner's time priority is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and

WHEREAS, the maximum authorized combined diversion rate is 900 cfs (405,000 gpm); and

WHEREAS, diversion of the water authorized with time priorities of March 14, 1955 and July 25, 1983 is subject to a special condition restricting diversion to specific minimum streamflows exclusive of contract water released by the Brazos River Authority for downstream use; and



WHEREAS, Applicant seeks to amend Certificate of Adjudication No. 12-5322 to add a diversion point approximately 3.9 miles upstream of the currently authorized point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7 in Fort Bend County, located at Latitude 29.504°N and Longitude 95.551°W. This diversion point is also authorized by Certificates of Adjudication No. 12-5168 and No. 12-5171, owned by the Gulf Coast Water Authority, and Certificates of Adjudication No. 12-5166 and No. 12-5167, owned by the Brazos River Authority; and

WHEREAS, Applicant also seeks an exempt interbasin transfer pursuant to Texas Water Code §11.085(v)(3) to authorize Galveston County as a place of use within its authorized service area in the San Jacinto-Brazos Coastal Basin; and

WHEREAS, no increase in the diversion amount or the diversion rate is being requested; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, the Executive Director recommends that special conditions be included in the amendment; and

WHEREAS, eight requests for a contested case hearing were received. Two requests for a contested case hearing were granted by the commission, and those two were subsequently withdrawn; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality Commission in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322E, is issued to the Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to the currently authorized place of use, Owner is also authorized an exempt interbasin transfer to use the 155,000 acre-feet of water per year in Galveston County, within its authorized service area, in the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

In addition to the authorization to divert water at a point on the Brazos River in the William Pettus Grant, Abstract No. 68 in Fort Bend County (Diversion Point 1), Owner is also authorized to divert water from a point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7, Fort Bend County, located at Latitude 29.504°N and Longitude 95.551°W (Diversion Point 2). This diversion point is also authorized by Certificates of Adjudication No. 12-5168 and No. 12-5171, owned by the Gulf Coast Water Authority, and Certificates of Adjudication No. 12-5166 and No. 12-5167, owned by the Brazos River Authority.

3. PRIORITY

- A. Time priority for diversion and use from Diversion Point 1 is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).
- B. Time priority for diversion and use of water from Diversion Point 2 is the same as Diversion Point 1, except that it is junior in time priority to the interjacent water rights between that point and Diversion Point 1 and to the existing water rights at those points, as those rights existed on August 24, 2006, the filing date of this amendment.

4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water is required to implement water conservation measures.

5. SPECIAL CONDITION

In addition to the special conditions already present in Certificate of Adjudication No. 12-5322, as amended, which remain in effect:

Prior to the diversion of water at the upstream diversion point authorized in this amendment, Owner shall apply for and be granted an amendment to this Certificate to add provisions providing that the Owner have an approved daily accounting plan and requiring maintenance of that daily plan. The plan must include, at a minimum, a method that accounts by priority date, diversion rate, restrictions and authorization number for all water diverted from the Brazos River at the upstream point pursuant to all authorizations to divert at that point. The plan must be provided in electronic format.

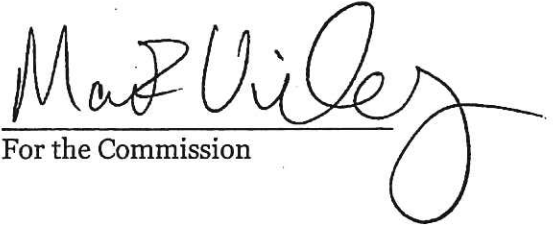
This amendment is issued subject to all terms, conditions, and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

  
For the Commission

ISSUED: **January 7, 2011**



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322F

TYPE: §§11.122 & 11.085

Owner:	Gulf Coast Water Authority	Address:	3630 Highway 1765 Texas City, Texas 77591
Filed:	March 10, 2010	Granted:	<b>MAR 30 2010</b>
Purpose:	Municipal, Industrial, and Agricultural	Counties:	Brazoria and Fort Bend Counties
Watercourse:	Brazos River	Watershed:	Brazos River Basin and San Jacinto-Brazos Coastal Basin

WHEREAS, Gulf Coast Water Authority (Owner) is authorized to divert and use not to exceed 155,000 acre-feet of water per year at a maximum combined diversion rate of 900 cfs (405,000 gpm) from the Brazos River, Brazos River Basin, at a point in the William Pettus Grant, Abstract No. 68 in Fort Bend County, for municipal, industrial, and agricultural (irrigation) purposes within the Owner's service area in Fort Bend, Brazoria, and Harris Counties in the Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin pursuant to an exempt interbasin transfer; and

WHEREAS, Owner is also authorized to maintain three off-channel reservoirs known as Juliff, Bonney, and Liverpool Reservoirs in Fort Bend and Brazoria Counties and impound therein a combined maximum of 864 acre-feet of water for industrial purposes and subsequent agricultural (irrigation) purposes; and

WHEREAS, multiple time priorities apply; and

WHEREAS, Special Condition 5.B. of Certificate of Adjudication No. 12-5322, as amended, authorizes Owner to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural (irrigation) and industrial purposes in that coastal basin; and

WHEREAS, Owner seeks to amend Certificate of Adjudication No. 12-5322 to authorize exempt interbasin transfer of Brazos River Basin contract water from the Brazos River Basin to the adjoining San Jacinto-Brazos Coastal Basin for agricultural (irrigation) purposes in that coastal basin; and

WHEREAS, no increase in the diversion amount or the diversion rate is being requested; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, no requests for a contested case hearing were received for this application; and

WHEREAS, Application No. 12-5322E by Gulf Coast Water Authority to amend Certificate of Adjudication No. 12-5322 is pending; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality Commission in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322F, is issued to the Gulf Coast Water Authority, subject to the following terms and conditions:

1. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

2. SPECIAL CONDITIONS

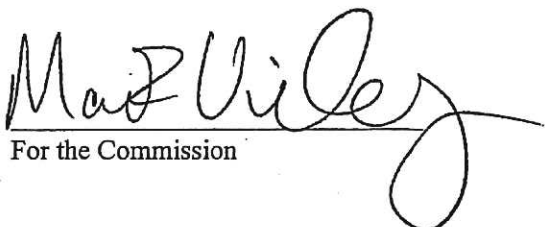
In addition to the existing authorizations in Special Condition 5.B. of Certificate of Adjudication No. 12-5322, as amended, Owner is authorized an exempt interbasin transfer of Brazos River Basin contract water from the Brazos River Basin to the adjoining San Jacinto-Brazos Coastal Basin for agricultural purposes in that coastal basin.

This amendment is issued subject to all terms, conditions, and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

  
For the Commission

ISSUED: **MAR 30 2010**

## **Texas Commission on Environmental Quality**

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### **Memorandum to File**

September 3, 2010

Amendment D to Certificate of Adjudication 5322, Gulf Coast Water Authority was withdrawn before being granted. The amendment letter was not reused for the subsequent amendment.

Amendment E to Certificate of Adjudication 5322, Gulf Coast Water Authority is currently before SOAH waiting a decision.



**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**  
**INTEROFFICE MEMORANDUM**

TO : Records Management

Date: July 26 2007

Certificate of Adjudication No. 12-5322C  
Fort Bend, Brazoria and Harris Counties  
Brazos River Basin

FROM : Water Rights Permitting & Availability Section  
Water Supply Division

SUBJECT : Change of Ownership

DELETE : Chocolate Bayou Water Company as owner

ADD : Gulf Coast Water Authority as owner

Water Rights Conveyance dated December 13, 2006, has been checked and found to cover all of the water right.

Ownership of Record with Addresses and Remarks:

Gulf Coast Water Authority  
3630 Highway 1765  
Texas City, Texas 77591

This certificate of adjudication authorizes the following:

- Impoundment of water in: 200.00 acre-foot capacity off-channel reservoir (Juliff Reservoir) located in the William Pettus Grant, Abstract 68, Fort Bend County; 144.00 acre-foot capacity off-channel reservoir (Bonney Reservoir) located in the Warren D. C. Hall Grant, Abstract 69, Brazoria County; and 520.00 acre-foot capacity off-channel reservoir (Liverpool Reservoir) located in the Day Land & Cattle Company Survey, Abstract 601, Brazoria County
- Use of 155,000 acre-feet of water per annum, from a diversion point located in the above mentioned William Pettus Grant in Fort Bend County on the Brazos River, for municipal, irrigation (of 41,200 acres of land) and industrial purposes within the owner's Service Area in Fort Bend, Brazoria and Harris Counties, including that part of its service area that lies within the San Jacinto Basin, by transferring the water from the Brazos River Basin to the San Jacinto-Brazos Coastal & the San Jacinto River Basins

MohamA Reddy

Data Entry Made: MC AUG 8 2007

WRP & A Section: \_\_\_\_\_

Change Noted: \_\_\_\_\_

Central Records/Date: \_\_\_\_\_

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322E

TYPE: §§11.122 & 11.085

Owner:	Gulf Coast Water Authority	Address:	3630 Highway 1765 Texas City, Texas 77591
Filed:	August 24, 2006	Granted:	January 7, 2011
Purpose:	Municipal, Industrial, and Agricultural (Irrigation)	Counties:	Fort Bend, Brazoria, Harris, and Galveston
Watercourse:	Brazos River	Watershed:	Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin

WHEREAS, Gulf Coast Water Authority (Owner or Applicant), is authorized to divert and use not to exceed 155,000 acre-feet of water per year a maximum combined diversion rate of 900 cfs (405,000 gpm) from the Brazos River, Brazos River Basin, at a point in the William Pettus Grant, Abstract No. 68 in Fort Bend County, for municipal, industrial, and agricultural (irrigation) purposes within the Owner's service area in Fort Bend, Brazoria, and Harris Counties in the Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin pursuant to an exempt interbasin transfer; and

WHEREAS, Owner is also authorized to maintain three off-channel reservoirs known as Juliff, Bonney, and Liverpool Reservoirs in Fort Bend and Brazoria Counties and impound therein a combined maximum of 864 acre-feet of water for industrial purposes and subsequent agricultural (irrigation) purposes; and

WHEREAS, Owner's time priority is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and

WHEREAS, the maximum authorized combined diversion rate is 900 cfs (405,000 gpm); and

WHEREAS, diversion of the water authorized with time priorities of March 14, 1955 and July 25, 1983 is subject to a special condition restricting diversion to specific minimum streamflows exclusive of contract water released by the Brazos River Authority for downstream use; and



WHEREAS, Applicant seeks to amend Certificate of Adjudication No. 12-5322 to add a diversion point approximately 3.9 miles upstream of the currently authorized point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7 in Fort Bend County, located at Latitude 29.504°N and Longitude 95.551°W. This diversion point is also authorized by Certificates of Adjudication No. 12-5168 and No. 12-5171, owned by the Gulf Coast Water Authority, and Certificates of Adjudication No. 12-5166 and No. 12-5167, owned by the Brazos River Authority; and

WHEREAS, Applicant also seeks an exempt interbasin transfer pursuant to Texas Water Code §11.085(v)(3) to authorize Galveston County as a place of use within its authorized service area in the San Jacinto-Brazos Coastal Basin; and

WHEREAS, no increase in the diversion amount or the diversion rate is being requested; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, the Executive Director recommends that special conditions be included in the amendment; and

WHEREAS, eight requests for a contested case hearing were received. Two requests for a contested case hearing were granted by the commission, and those two were subsequently withdrawn; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality Commission in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322E, is issued to the Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to the currently authorized place of use, Owner is also authorized an exempt interbasin transfer to use the 155,000 acre-feet of water per year in Galveston County, within its authorized service area, in the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

In addition to the authorization to divert water at a point on the Brazos River in the William Pettus Grant, Abstract No. 68 in Fort Bend County (Diversion Point 1), Owner is also authorized to divert water from a point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7, Fort Bend County, located at Latitude 29.504°N and Longitude 95.551°W (Diversion Point 2). This diversion point is also authorized by Certificates of Adjudication No. 12-5168 and No. 12-5171, owned by the Gulf Coast Water Authority, and Certificates of Adjudication No. 12-5166 and No. 12-5167, owned by the Brazos River Authority.

3. PRIORITY

- A. Time priority for diversion and use from Diversion Point 1 is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).
- B. Time priority for diversion and use of water from Diversion Point 2 is the same as Diversion Point 1, except that it is junior in time priority to the interjacent water rights between that point and Diversion Point 1 and to the existing water rights at those points, as those rights existed on August 24, 2006, the filing date of this amendment.

4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water is required to implement water conservation measures.

5. SPECIAL CONDITION

In addition to the special conditions already present in Certificate of Adjudication No. 12-5322, as amended, which remain in effect:

Prior to the diversion of water at the upstream diversion point authorized in this amendment, Owner shall apply for and be granted an amendment to this Certificate to add provisions providing that the Owner have an approved daily accounting plan and requiring maintenance of that daily plan. The plan must include, at a minimum, a method that accounts by priority date, diversion rate, restrictions and authorization number for all water diverted from the Brazos River at the upstream point pursuant to all authorizations to divert at that point. The plan must be provided in electronic format.

This amendment is issued subject to all terms, conditions, and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

  
For the Commission

ISSUED: **January 7, 2011**

Kathleen Hartnett White, *Chairman*  
Larry R. Soward, *Commissioner*  
H. S. Buddy Garcia, *Commissioner*  
Glenn Shankle, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

July 26, 2007

Gulf Coast Water Authority  
3630 Highway 1765  
Texas City, Texas 77591

Re: Certificate of Adjudication No. 12-5322C  
Impoundment of water in: 200 acre-foot capacity off-channel reservoir (Juliff Reservoir) located in the William Pettus Grant, Abstract 68, Fort Bend County; 144 acre-foot capacity off-channel reservoir (Bonney Reservoir) located in the Warren D. C. Hall Grant, Abstract 69, Brazoria County; and 520 acre-foot capacity off-channel reservoir (Liverpool Reservoir) located in the Day Land & Cattle Company Survey, Abstract 601, Brazoria County

Use of 155,000 acre-feet of water per annum, from a diversion point located in the above mentioned William Pettus Grant in Fort Bend County on the Brazos River, for municipal, irrigation (of 41,200 acres of land) and industrial purposes within the owner's Service Area in Fort Bend, Brazoria and Harris Counties, including that part of its service area that lies within the San Jacinto Basin, by transferring the water from the Brazos River Basin to the San Jacinto-Brazos Coastal & the San Jacinto River Basins

Gentlemen:

Based on the copies of the documents submitted by Mr. David J. Klein, attorney at law, along with your Change of Ownership form and the related \$100.00 fee, we are changing our records to reflect Gulf Coast Water Authority as the owner of the referenced water rights under the referenced certificate of adjudication.

If we can be of any assistance in the future, please do not hesitate to contact us.

Very truly yours,

A handwritten signature in black ink that reads "Mohan A. Reddy".

Mohan A. Reddy  
Water Rights Permitting & Availability Section--MC 160--(Please use this code as part of my address)  
Water Supply Division  
512/239-4611

Cc: Mr. David J. Klein  
Lloyd Gosselink  
Attorneys At Law  
816 Congress Avenue, Suite 1900  
Austin, Texas 78701



# TEXAS NATURAL RESOURCE CONSERVATION COMMISSION



## AMENDMENT TO CERTIFICATE OF ADJUDICATION

CERTIFICATE NO.	12-5322C	Type:	§11.122 & 11.085
Owner:	Chocolate Bayou Water Company	Address	P. O. Box 550 Alvin, Texas 77512-0550
Filed:	August 7, 2001	Granted:	SEP 12 2001
Purpose:	Municipal, Industrial Irrigation	County:	Fort Bend, Brazoria And Harris
Watercourse:	Brazos River	Watershed:	Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company (CBWC) on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with respective impoundment capacities of 200, 144, and 520 acre-feet of water in Fort Bend and Brazoria Counties; and

WHEREAS, Certificate of Adjudication No. 12-5322 contains special stream flow conditions under which the authorized water may be diverted; and

WHEREAS, Certificate of Adjudication No. 12-5322, as amended, authorizes the owner to divert and use not to exceed 145,000 acre-feet of water per annum to irrigate 41,200 acres of land and not to exceed 10,000 acre-feet of water per annum for industrial purposes from a point on the Brazos River in the William Pettus Grant, Abstract No. 68, Fort Bend County, for use within the owner's service area in Fort Bend and Brazoria Counties; and

WHEREAS, the time priority is February 8, 1929 for the diversion and use of the first 40,000 acre-feet of water at a maximum diversion rate of 400 cubic feet per second (180,000 gallons per minute), March 14, 1955 for the diversion and use of the next 40,000 acre-feet of water at a maximum diversion rate of 668 cfs (300,600 gpm), and July 25, 1983 for the diversion and use of the remaining 75,000 acre-feet of water at a maximum diversion rate of 900 cfs (405,000 gpm); and

WHEREAS, Certificate of Adjudication No. 12-5322, as amended, authorizes the owner to use the aforesaid reservoirs to impound water for irrigation and industrial purposes; and



WHEREAS, Special Condition B to Certificate of Adjudication No. 12-5322, as amended, authorizes the owner to transfer water diverted from the Brazos River Basin to the San Jacinto-Brazos River Coastal Basin for irrigation and industrial purposes in said basin; and

WHEREAS, Chocolate Bayou Water Company seeks to amend Certificate of Adjudication No. 12-5322 to authorize, pursuant to Texas Water Code (TWC) §44.023(e), multi-purpose use (irrigation, industrial, and/or municipal) for the 155,000 acre-feet of water per annum authorized for diversion, to add Harris County to the counties within the service area of CBWC, and to authorize the place of use to include that part of CBWC's service that lies within the San Jacinto Basin; and

WHEREAS, the Texas Natural Resource Conservation Commission finds that jurisdiction over the application is established; and

WHEREAS, the diversion and use of water requested by this application lies within the Coastal Zone Management Plan area, and the application has been reviewed for and found to comply with the Coastal Zone Management Plan; and

WHEREAS no one protested the granting of the proposed amendment to Certificate of Adjudication No. 12-5322; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Natural Resource Conservation Commission in issuing this amendment.

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, as amended, designated as Certificate of Adjudication 12-5322C, is issued to the Chocolate Bayou Water Company subject to the following terms and conditions:

1. USE

In lieu of the purpose of use authorizations of Certificate Adjudication No. 12-5322, as amended, owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum for municipal, irrigation and industrial purposes for use within the owner's service area in Fort Bend, Brazoria and Harris Counties.

2. CONSERVATION

Certificate owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses

3. SPECIAL CONDITIONS

- D. In lieu of the provisions of Special Condition 5B contained in Certificate of Adjudication No. 12-5322, as amended, owner may transfer water authorized herein from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin and the San Jacinto River Basin for use within the owner's service area in Fort Bend, Brazoria, and Harris Counties.
- E. Owner shall submit, or require wholesaler contract holders to prepare and adopt, a wholesale water conservation and drought contingency plan within 180 days prior to the diversion of the water for the new purposes and places of use authorized under this amendment. The plan shall meet the minimum requirements as defined in Title 30 TAC Chapter §288.5 and §288.22 and shall set forth strategies for ongoing conservation.
- F. Permittee is required to record for reporting purpose the actual monthly amounts used for the individual purposes (municipal, irrigation and industrial) under the multi-purpose authorization.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Natural Resource Conservation Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS NATURAL RESOURCE  
CONSERVATION COMMISSION



For the Commission

Date Issued: SEP 12 2001



AMENDMENT TO  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322B TYPE: AMENDMENT

Name: Chocolate Bayou Water Company Address: P. O. Box 550  
Alvin, Texas 77512-0550

Filed: September 11, 1990 Granted: October 10, 1990

Purposes: Industrial and Irrigation Counties: Fort Bend and Brazoria Counties

Watercourse: Brazos River Watershed: Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with impoundment capacities of 200, 144 and 520 acre-feet in Fort Bend and Brazoria Counties; and

WHEREAS, owner is also authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the company's service area in Fort Bend and Brazoria Counties, Texas at a maximum diversion rate of 900 cfs (405,000 gpm); and

WHEREAS, Special Condition B. of Certificate No. 12-5322, authorizes the transfer of water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation purposes; and

WHEREAS, Special Condition C. of Certificate No. 12-5322, authorized the use of the reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season; and

WHEREAS, Certificate No. 12-5322A was issued on August 16, 1988 wherein Special Condition C., was changed and authorization was obtained to concurrently use the water stored in the aforesaid off-channel reservoirs for in-place industrial (fish farming) purposes; and

WHEREAS, Chocolate Bayou Water Company has requested an amendment to Certificate No. 12-5322, as amended, to convert water from irrigation purposes to industrial purposes; and to change Special Condition B. and C. for clarification purposes relating to the use change; and

WHEREAS, the Texas Water Commission finds that jurisdiction over the application is established; and

WHEREAS, no person protested the granting of this application; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Water Commission in issuing this amendment.

NOW, THEREFORE, this amendment to Certificate No. 12-5322, as amended, is issued to Chocolate Bayou Water Company, subject to the following provisions:

1. In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended:

Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the owner's service area.

2. In lieu of Special Condition C., contained in Certificate No. 12-5322A, owner is authorized the use of the aforesaid reservoirs to impound water for irrigation and industrial purposes.
3. In lieu of Special Condition B., contained in Certificate No. 12-5322, as amended, owner is authorized to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation and industrial purposes in said coastal basin.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

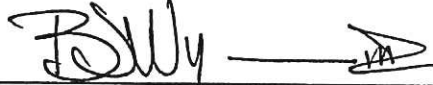
Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

Certificate owner shall use those practices, techniques, and technologies that will reduce the loss or waste of water, improve the efficiency and use of water so that only so much water as can be beneficially used will be diverted. Furthermore, diversion and use will occur only when reasonably necessary because of prevailing climate conditions and subject to the terms and conditions of this certificate.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Water Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS WATER COMMISSION

  
B. J. Wynne, III, Chairman

DATE ISSUED: OCT 29 1990

ATTEST:

  
Brenda W. Foster, Chief Clerk



AMENDMENT TO  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322A

TYPE:           AMENDMENT

Name:	Chocolate Bayou Water Company	Address:	P.O. Box 550 Alvin, Texas 77512-0550
Filed:	July 14, 1988	Granted:	August 9, 1988
Purpose:	Industrial	Counties:	Fort Bend and Brazoria
Watercourse:	Brazos River	Watershed:	Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with impoundment capacities of 200, 144 and 520 acre-feet in Fort Bend and Brazoria Counties and to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River at a maximum diversion rate of 900 cfs (405,000 gpm) to irrigate a maximum of 41,200 acres of land within the company's service area in Fort Bend and Brazoria Counties, Texas; and

WHEREAS, Special Condition C. of the certificate states that "Owner is authorized the use of the aforesaid reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season"; and

WHEREAS, Chocolate Bayou Water Company has requested an amendment to Certificate No. 12-5322 to also allow the use of the reservoirs concurrently for industrial purposes (to raise fish on a commercial basis); and

WHEREAS, Chocolate Bayou Water Company has indicated that during periods other than the irrigation season the reservoirs will impound water from sources other than authorized under the certificate; and

NOW, THEREFORE, this amendment to Certificate No. 12-5322 is issued to Chocolate Bayou Water Company as follows:

1. USE

In addition to the authorization included in Paragraph 2., USE, of Certificate No. 12-5322, certificate owner is authorized to use water stored in the off-channel reservoirs for in-place industrial (fish farming) purposes.

2. SPECIAL CONDITION

In lieu of Special Condition C, contained in Certificate No. 12-5322, the following is substituted:

C. Certificate owner is authorized the use of the aforesaid reservoirs as buffer reservoirs to facilitate pumping and efficiency as part of owner's irrigation system and to concurrently use the impounded water for in-place industrial purposes.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate No. 12-5322, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Water Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS WATER COMMISSION

DATE ISSUED: August 16, 1988

  
B. J. Wynne, III, Chairman

ATTEST:

  
Karen A. Phillips, Chief Clerk

CERTIFICATE OF ADJUDICATION

CERTIFICATE OF ADJUDICATION: 12-5322

OWNER: Chocolate Bayou Water  
Company  
P. O. Box 1305  
Alvin, Texas 77511

COUNTIES: Fort Bend and Brazoria

PRIORITY DATES: February 8, 1929;  
March 14, 1955  
and July 25, 1983

WATERCOURSE: Brazos River

BASIN: Brazos River

WHEREAS, by final decree of the 21st Judicial District Court of Bastrop County, in Cause No. 18,762, In Re: The Adjudication of Water Rights in the Brazos IV Segment of the Brazos River Basin and the San Jacinto-Brazos Coastal Basin dated June 1, 1987 a right was recognized under Permit 1145E authorizing the Chocolate Bayou Water Company to appropriate waters of the State of Texas as set forth below:

NOW, THEREFORE, this certificate of adjudication to appropriate waters of the State of Texas in the Brazos River Easin is issued to the Chocolate Bayou Water Company, subject to the following terms and conditions:

1. IMPOUNDMENT

- A. Owner is authorized to maintain and impound water in an existing 200 acre-foot capacity off-channel reservoir (Juliff Reservoir). The reservoir is located in the William Pettus Grant, Abstract 68, Fort Bend County, Texas.
- B. Owner is authorized to maintain and impound water in an existing 144 acre-foot capacity off-channel reservoir (Bonney Reservoir). The reservoir is located in the Warren D. C. Hall Grant, Abstract 69, Brazoria County, Texas.
- C. Owner is authorized to maintain and impound water in an existing 520 acre-foot capacity off-channel reservoir (Liverpool Reservoir). The reservoir is located in the Day Land & Cattle Company Survey, Abstract 601, Brazoria County, Texas.

2. USE

Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.



Certificate of Adjudication 12-5322

3. DIVERSION

- A. Location:  
At a point on the Brazos River in the William Pettus Grant, Abstract 68, Fort Bend County, Texas.
- B. Maximum rate: 900.00 cfs (405,000 gpm).

4. PRIORITY

- A. The time priority of owner's right is February 8, 1929 for the diversion and use of the first 40,000 acre-feet of water at a maximum diversion rate of 400 cfs (180,000 gpm).
- B. The time priority of owner's right is March 14, 1955 for the diversion and use of the next 40,000 acre-feet of water at a maximum diversion rate of 668 cfs (300,600 gpm).
- C. The time priority of owner's right is July 25, 1983 for the diversion and use of the remaining 75,000 acre-feet of water at the maximum authorized diversion rate of 900 cfs (405,000 gpm).

5. SPECIAL CONDITIONS

- A. The 115,000 acre-feet of water diverted under priority dates of March 14, 1955 and July 25, 1983, may be diverted only under certain flow restrictions measured at the USGS gaging station No. 08116650 on the Brazos River at Rosharon, Texas, which is to be reinstated by owner and provided with remote interrogation facilities prior to diversion.
  - (1) Owner is authorized to divert water only when the flow of the Brazos River at the USGS gaging station at Rosharon, Texas, equals or exceeds 700 cfs; or when the gaging station is below 700 cfs but is at least 15 cfs during April through August and 5 cfs during all other months of the year and the diversions of water hereunder are not injurious to senior downstream appropriators; or when the water being diverted are waters lawfully purchased by the owner from the Brazos River Authority under existing legal contract between the two parties, or other waters lawfully purchased under any other legal contract.
  - (2) The aforesaid streamflow restrictions are exclusive of any releases dedicated by the Brazos River Authority from its conservation storage for subsequent use downstream. The Executive Director has established a procedure for advising owner when water, exclusive of Brazos River Authority's dedicated releases, is available for

Certificate of Adjudication 12-5322

diversion hereunder. Owner shall contact the Commission prior to diversion of water hereunder each irrigation season to be advised of this procedure.

- (3) Owner shall establish and maintain sufficient daily diversion and streamflow records to document which authorizations and appropriate restrictions are being exercised.
  - (4) In order to prevent distortions in assessing any streamflow restriction requirements in analyses of future applications to appropriate water from the Brazos River, the Commission may for the purposes of these hydrology analyses consider that a 406 cfs streamflow restriction is sufficient to provide substantial protection to existing water rights. In making such analyses, the Commission should utilize the 406 cfs streamflow restriction, rather than the 700 cfs restriction.
- B. Owner is authorized to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation purposes in said coastal basin.
- C. Owner is authorized the use of the aforesaid reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season.

The location of pertinent features related to this certificate are shown on Pages 31 and 34 of the Brazos IV River Segment Certificates of Adjudication Maps, copies of which are located in the office of the Texas Water Commission, Austin, Texas.

This certificate of adjudication is issued subject to all terms, conditions and provisions in the final decree of the 21st Judicial District Court of Bastrop County, Texas, in Cause No. 18,762, In Re: The Adjudication of Water Rights in the Brazos IV Segment of the Brazos River Basin and the San Jacinto-Brazos Coastal Basin dated June 1, 1987 and supersedes all rights of the owner asserted in that cause.

This certificate of adjudication is issued subject to senior and superior water rights in the Brazos River Basin.



Certificate of Adjudication 12-5322

This certificate of adjudication is issued subject to the Rules of the Texas Water Commission and its continuing right of supervision of State water resources consistent with the public policy of the State as set forth in the Texas Water Code.

TEXAS WATER COMMISSION

*Paul Hopkins*

Paul Hopkins, Chairman

DATE ISSUED:

JAN 14 1938

ATTEST:

*Karen A. Phillips*

Karen A. Phillips, Chief Clerk

TCEQ DOCKET NO. 2004-1997-WR  
SOAH DOCKET NO. 582-05-9443

APPLICATION BY CHOCOLATE	§	BEFORE THE TEXAS
BAYOU WATER COMPANY TO	§	COMMISSION ON
AMEND CERTIFICATE OF	§	ENVIRONMENTAL QUALITY
ADJUDICATION NO. 12-5322	§	

ORDER

On August 10, 2005, the Texas Commission on Environmental Quality considered hearing requests regarding an application by Chocolate Bayou Water Company to amend its Certificate of Adjudication No. 12-5322 to add a diversion point to its water right on the Brazos River in Waller County, Texas. The Commission granted the hearing requests of some requestors in an Interim Order dated August 15, 2005, and referred the application to the State Office of Administrative Hearings (SOAH) for a contested case hearing on the merits.

On October 3, 2005 a preliminary hearing was held in which jurisdiction of the matter was taken at SOAH.

On December 16, 2005, Chocolate Bayou Water Company filed a motion with SOAH requesting the withdrawal of its application. The Honorable Sharon Cloninger, presiding administrative law judge (ALJ), considered the Applicant's Motion to Withdraw, the response filed on December 16, 2005 by the City of Houston, the Brazos River Authority, and the Texas Water Development Board, and the Applicant's Reply to the response filed December 20, 2005. The ALJ issued Order No. 3 on December 21, 2005, which ordered that the Applicant's application be withdrawn with prejudice and the matter dismissed from the docket of SOAH and remanded back to the Executive Director for final disposition pursuant to 30 TEX. ADMIN. CODE § 80.25(a) and (b).

NOW, THEREFORE, BE IT ORDERED BY THE EXECUTIVE DIRECTOR OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY that:

Pursuant to 30 TEX. ADMIN. CODE §§ 80.25(a) and 80.101, the petition by Chocolate Bayou Water Company for an amendment to Certificate of Adjudication No. 12-5322 is dismissed with prejudice.

The Chief Clerk of the Texas Commission on Environmental Quality shall forward a copy of this Order to the parties.

If any provision, sentence, clause, or phrase of this Order is for any reason held to be invalid, the invalidity of any portion shall not affect the validity of the remaining portions of the Order.

Issue Date: SEP 27 2006

TEXAS COMMISSION ON  
ENVIRONMENTAL QUALITY

  
For the Executive Director

KA  
TEXAS  
WATER  
DEVELOPMENT  
BOARD  
ON ENVIRONMENTAL  
QUALITY

SOAH DOCKET NO. 582-05-9443  
TCEQ DOCKET NO. 2004-1997-WR

2005-12-23 PM 1:40

APPLICATION BY  
CHOCOLATE BAYOU WATER  
SUPPLY COMPANY  
TO AMEND CERTIFICATE OF  
ADJUDICATION NO. 12-5322

§  
§  
§  
§  
§


BEFORE THE STATE OFFICE  
OF  
ADMINISTRATIVE HEARINGS

ORDER NO. 3  
GRANTING MOTION TO WITHDRAW APPLICATION  
AND DISMISSING CASE FROM SOAH'S DOCKET

On December 16, 2005, Chocolate Bayou Water Supply Company (Applicant) filed a Motion to Withdraw Application. On that same date, a response to the motion was filed by the City of Houston (Houston), the Brazos River Authority (BRA), and the Texas Water Development Board (TWDB), stating Applicant did not indicate whether its application was to be withdrawn with or without prejudice, and that Houston, BRA, and TWDB have no objection to the withdrawal of the application with prejudice. On December 20, 2005, Applicant filed a reply to the response to its motion, stating its intent to withdraw its application with prejudice. The Administrative Law Judge finds the motion and its clarification in the reply to have merit.

THEREFORE IT IS ORDERED that the motion is GRANTED, Applicant's application is withdrawn with prejudice pursuant to 30 TEX. ADMIN. CODE § 80.25(a)(b), and this matter is dismissed from the docket of the State Office of Administrative Hearings.

SIGNED December 21, 2005.

  
SHARON CLONINGER  
ADMINISTRATIVE LAW JUDGE  
STATE OFFICE OF ADMINISTRATIVE HEARINGS

# **Application for Amendment of Certificate of Adjudication 12-5322**

**Gulf Coast Water Authority  
2018**



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

## TCEQ WATER RIGHTS PERMITTING APPLICATION

### ADMINISTRATIVE INFORMATION CHECKLIST

Complete and submit this checklist for each application. See Instructions Page. 5.

APPLICANT(S): Gulf Coast Water Authority (GCWA)

Indicate whether the following items are included in your application by writing either Y (for yes) or N (for no) next to each item (all items are not required for every application).

Y/N

Y Administrative Information Report  
N Additional Co-Applicant Information  
N Additional Co-Applicant Signature Pages  
Y Written Evidence of Signature Authority  
Y Technical Information Report  
Y USGS Map (or equivalent)  
Y Map Showing Project Details  
Y Original Photographs  
Y Water Availability Analysis  
Y Worksheet 1.0  
N Recorded Deeds for Irrigated Land  
N Consent For Irrigation Land  
Y Worksheet 1.1  
N Addendum to Worksheet 1.1  
Y Worksheet 1.2  
Y Addendum to Worksheet 1.2  
N Worksheet 2.0  
N Additional W.S 2.0 for Each Reservoir  
N Dam Safety Documents  
N Notice(s) to Governing Bodies  
N Recorded Deeds for Inundated Land  
N Consent For Inundation Land

Y/N

Y Worksheet 3.0  
Y Additional W.S 3.0 for each Point  
Y Recorded Deeds for Diversion Points  
Y Consent For Diversion Access  
Y Worksheet 4.0  
N TPDES Permit(s)  
N WWTP Discharge Data  
N 24-hour Pump Test  
N Groundwater Well Permit  
N Signed Water Supply Contract  
Y Worksheet 4.1  
Y Worksheet 5.0  
Y Addendum to Worksheet 5.0  
Y Worksheet 6.0  
Y Water Conservation Plan(s)  
Y Drought Contingency Plan(s)  
Y Documentation of Adoption  
Y Worksheet 7.0  
Y Accounting Plan  
Y Worksheet 8.0  
Y Fees

#### For Commission Use Only:

Proposed/Current Water Right Number: \_\_\_\_\_

Basin: \_\_\_\_\_ Watermaster area Y/N: \_\_\_\_\_

# ADMINISTRATIVE INFORMATION REPORT

The following information is **required** for all new applications and amendments.

**\*\*\*Applicants are strongly encouraged to schedule a pre-application meeting with TCEQ Staff to discuss Applicant's needs prior to submitting an application. Call the Water Rights Permitting Team to schedule a meeting at (512) 239-4691.**

## 1. TYPE OF APPLICATION (Instructions, Page. 6)

Indicate, by marking X, next to the following authorizations you are seeking.

☐ New Appropriation of State Water

☒ Amendment to a Water Right \*

☐ Bed and Banks

***\*If you are seeking an amendment to an existing water rights authorization, you must be the owner of record of the authorization. If the name of the Applicant in Section 2, does not match the name of the current owner(s) of record for the permit or certificate or if any of the co-owners is not included as an applicant in this amendment request, your application could be returned. If you or a co-applicant are a new owner, but ownership is not reflected in the records of the TCEQ, submit a change of ownership request (Form TCEQ-10204) prior to submitting the application for an amendment. See Instructions page. 6. Please note that an amendment application may be returned, and the Applicant may resubmit once the change of ownership is complete.***

Please summarize the authorizations or amendments you are seeking in the space below or attach a narrative description entitled "Summary of Request."

GCWA holds Certificates of Adjudication (CA) 12-5168, 12-5171, and 12-5322 on the Brazos River. GCWA is seeking an amendment to CA 12-5322 to allow diversion at GCWA's American Canal (Shannon pump station), which is authorized under CA 12-5168 and 12-5171. The application for CA 12-5322 also seeks to add mining as an authorized use, an interbasin transfer from the Brazos River basin to the San Jacinto-Brazos Coastal basin, conversion of points to reaches, express language on the current authorization to use the bed and banks of portions of Jones and Oyster Creeks that are part of GCWA's existing canal system, and other changes as detailed in the Supplement to Applications for Water Right Amendments.



## 2. APPLICANT INFORMATION (Instructions, Page. 6 )

### a. Applicant

Indicate the number of Applicants/Co-Applicants 1  
(Include a copy of this section for each Co-Applicant, if any)

What is the Full Legal Name of the individual or entity (applicant) applying for this permit?

Gulf Coast Water Authority (GCWA)

*(If the Applicant is an entity, the legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)*

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)?  
You may search for your CN on the TCEQ website at

<http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch>

CN : CN600566152 ( leave blank if you do not yet have a CN).

What is the name and title of the person or persons signing the application? Unless an application is signed by an individual applicant, the person or persons must submit written evidence that they meet the signatory requirements in 30 TAC § 295.14.

First/Last Name: Ivan Langford

Title: General Manager

Have you provided written evidence meeting the signatory requirements in 30 TAC § 295.14, as an attachment to this application? Yes

What is the applicant's mailing address as recognized by the US Postal Service (USPS)? You may verify the address on the USPS website at

<https://tools.usps.com/go/ZipLookupAction!input.action>.

Name: Gulf Coast Water Authority

Mailing Address: 3630 FM 1765

City: Texas City

State: Texas

ZIP Code: 77591

Indicate an X next to the type of Applicant:

☐ Individual

☐ Sole Proprietorship-D.B.A.

☐ Partnership

☐ Corporation

☐ Trust

☐ Estate

☐ Federal Government

☐ State Government

☐ County Government

☐ City Government

☐ Other Government

☒ Other Conservation and Reclamation District

For Corporations or Limited Partnerships, provide:

State Franchise Tax ID Number: N/A SOS Charter (filing) Number: N/A

### 3. APPLICATION CONTACT INFORMATION (Instructions, Page. 9)

If the TCEQ needs additional information during the review of the application, who should be contacted? Applicant may submit their own contact information if Applicant wishes to be the point of contact.

First and Last Name: Ivan Langford

Title: General Manager

Organization Name: Gulf Coast Water Authority

Mailing Address: 3630 FM 1765

City: Texas City

State: Texas

ZIP Code: 77591

Phone No.: 409-797-4907

Extension: N/A

Fax No.: 409-935-4156

E-mail Address: [ilangford@gcwater.org](mailto:ilangford@gcwater.org)

#### 4. WATER RIGHT CONSOLIDATED CONTACT INFORMATION (Instructions, Page. 9)

This section applies only if there are multiple Owners of the same authorization. Unless otherwise requested, Co-Owners will each receive future correspondence from the Commission regarding this water right (after a permit has been issued), such as notices and water use reports. Multiple copies will be sent to the same address if Co-Owners share the same address. Complete this section if there will be multiple owners and all owners agree to let one owner receive correspondence from the Commission. Leave this section blank if you would like all future notices to be sent to the address of each of the applicants listed in section 2 above.

I/We authorize all future notices be received on my/our behalf at the following:

First and Last Name: N/A

Title: N/A

Organization Name: N/A

Mailing Address: N/A

City: N/A

State: N/A

ZIP Code: N/A

Phone No.: N/A

Extension: N/A

Fax No.: N/A

E-mail Address: N/A



## 5. MISCELLANEOUS INFORMATION (Instructions, Page. 9)

- a. The application will not be processed unless all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol by all applicants/co-applicants. If you need assistance determining whether you owe delinquent penalties or fees, please call the Water Rights Permitting Team at (512) 239-4691, prior to submitting your application.

1. Does Applicant or Co-Applclicant owe any fees to the TCEQ? **Yes / No No**

If **yes**, provide the following information:

Account number: **N/A**

Amount past due: **N/A**

2. Does Applicant or Co-Applclicant owe any penalties to the TCEQ? **Yes / No No**

If **yes**, please provide the following information:

Enforcement order number: **N/A**

Amount past due: **N/A**

- b. If the Applicant is a taxable entity (corporation or limited partnership), the Applicant must be in good standing with the Comptroller or the right of the entity to transact business in the State may be forfeited. See Texas Tax Code, Subchapter F. Applicant's may check their status with the Comptroller at <https://mycpa.cpa.state.tx.us/coa/>

Is the Applicant or Co-Applclicant in good standing with the Comptroller? **Yes / No Yes**

- c. The commission will not grant an application for a water right unless the applicant has submitted all Texas Water Development Board (TWDB) surveys of groundwater and surface water use - if required. See TWC §16.012(m) and 30 TAC § 297.41(a)(5).

Applicant has submitted all required TWDB surveys of groundwater and surface water? **Yes / No Yes**

**6. SIGNATURE PAGE (Instructions, Page. 11)**

Applicant:

I, Ivan Langford

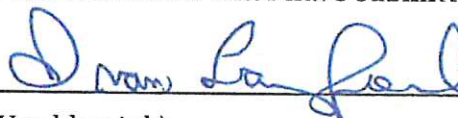
General Manager

(Typed or printed name)

(Title)

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under Title 30 Texas Administrative Code §295.14 to sign and submit this document and I have submitted written evidence of my signature authority.

Signature:   
(Use blue ink)

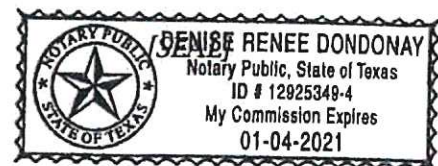
Date: 10/22/2018

Subscribed and Sworn to before me by the said

on this 22nd day of October, 2018.

My commission expires on the 4th day of January, 2021.

Denise Renee Dondonay  
Notary Public Denise Renee Dondonay  
Galveston  
County, Texas



***If the Application includes Co-Applicants, each Applicant and Co-Applicant must submit an original, separate signature page***



# TECHNICAL INFORMATION REPORT

## WATER RIGHTS PERMITTING

This Report is required for applications for new or amended water rights. Based on the Applicant's responses below, Applicants are directed to submit additional Worksheets (provided herein). A completed Administrative Information Report is also required for each application.

**Applicants are strongly encouraged to schedule a pre-application meeting with TCEQ Permitting Staff to discuss Applicant's needs and to confirm information necessary for an application prior to submitting such application. Please call Water Availability Division at (512) 239-4691 to schedule a meeting.** Applicant attended a pre-application meeting with TCEQ Staff for this Application? Y / N **Y** (If yes, date : 11/21/2017).

### 1. New or Additional Appropriations of State Water. Texas Water Code (TWC) § 11.121 (Instructions, Page. 12)

**State Water is:** *The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state. TWC § 11.021.*

- a. Applicant requests a new appropriation (diversion or impoundment) of State Water? Y / N **N**
- b. Applicant requests an amendment to an existing water right requesting an increase in the appropriation of State Water or an increase of the overall or maximum combined diversion rate? Y / N **N** (If yes, indicate the Certificate or Permit number: N/A)

*If Applicant answered yes to (a) or (b) above, does Applicant also wish to be considered for a term permit pursuant to TWC § 11.1381?* **N/A** Y / N

- c. Applicant requests to extend an existing Term authorization or to make the right permanent? Y / N **N** (If yes, indicate the Term Certificate or Permit number: N/A)

*If Applicant answered yes to (a), (b) or (c), the following worksheets and documents are required:*

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir requested in the application)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for each diversion point and/or one worksheet for the upstream limit and one worksheet for the downstream limit of each diversion reach requested in the application)
- **Worksheet 5.0 – Environmental Information Worksheet**
- **Worksheet 6.0 – Water Conservation Information Worksheet**
- **Worksheet 7.0 – Accounting Plan Information Worksheet**
- **Worksheet 8.0 – Calculation of Fees**
- **Fees calculated on Worksheet 8.0 – see instructions Page. 34.**
- **Maps – See instructions Page. 15.**
- **Photographs – See instructions Page. 30.**

*Additionally, if Applicant wishes to submit an alternate source of water for the project/authorization, see Section 3, Page 3 for Bed and Banks Authorizations (Alternate sources may include groundwater, imported water, contract water or other sources).*

**Additional Documents and Worksheets may be required (see within).**



## 2. Amendments to Water Rights. TWC § 11.122 (Instructions, Page. 12)

This section should be completed if Applicant owns an existing water right and Applicant requests to amend the water right. *If Applicant is not currently the Owner of Record in the TCEQ Records, Applicant must submit a Change of Ownership Application (TCEQ-10204) prior to submitting the amendment Application or provide consent from the current owner to make the requested amendment. See instructions page. 6.*

Water Right (Certificate or Permit) number you are requesting to amend: 12-5322

Applicant requests to sever and combine existing water rights from one or more Permits or Certificates into another Permit or Certificate? Y / N **N** (if yes, complete chart below):

List of water rights to sever	Combine into this ONE water right
N/A	N/A

- a. Applicant requests an amendment to an existing water right to increase the amount of the appropriation of State Water (diversion and/or impoundment)? Y / N **N**

*If yes, application is a new appropriation for the increased amount, complete Section 1 of this Report (PAGE. 1) regarding New or Additional Appropriations of State Water.*

- b. Applicant requests to amend existing Term authorization to extend the term or make the water right permanent (remove conditions restricting water right to a term of years)? Y / N **N**

*If yes, application is a new appropriation for the entire amount, complete Section 1 of this Report (PAGE. 1) regarding New or Additional Appropriations of State Water.*

- c. Applicant requests an amendment to change the purpose or place of use or to add an additional purpose or place of use to an existing Permit or Certificate? Y / N **Y**

*If yes, submit:*

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 1.2 - Notice: “Marshall Criteria”**

- d. Applicant requests to change: diversion point(s); or reach(es); or diversion rate? Y / N **Y**

*If yes, submit: Worksheet 3.0 - Diversion Point Information Worksheet (submit one worksheet for each diversion point or one worksheet for the upstream limit and one worksheet for the downstream limit of each diversion reach)*

- e. Applicant requests amendment to add or modify an impoundment, reservoir, or dam? Y / N **N**

*If yes, submit: Worksheet 2.0 - Impoundment/Dam Information Worksheet (submit one worksheet for each impoundment or reservoir)*

- f. Other - Applicant requests to change any provision of an authorization not mentioned above? Y / N **Y** *If yes, call the Water Availability Division at (512) 239-4691 to discuss.*

**Additionally, all amendments require:**

- **Worksheet 8.0 – Calculation of Fees; and Fees calculated – see instructions Page.34**
- **Maps – See instructions Page. 15.**
- **Additional Documents and Worksheets may be required (see within).**



### 3. Bed and Banks. TWC § 11.042 (Instructions, Page 13)

- a. Pursuant to contract, Applicant requests authorization to convey, stored or conserved water to the place of use or diversion point of purchaser(s) using the bed and banks of a watercourse? TWC § 11.042(a). Y/N **Y**

*If yes, submit a signed copy of the Water Supply Contract pursuant to 30 TAC §§ 295.101 and 297.101. Further, if the underlying Permit or Authorization upon which the Contract is based does not authorize Purchaser's requested Quantity, Purpose or Place of Use, or Purchaser's diversion point(s), then either:*

- 1. Purchaser must submit the worksheets required under Section 1 above with the Contract Water identified as an alternate source; or*
- 2. Seller must amend its underlying water right under Section 2.*

- b. Applicant requests to convey water imported into the state from a source located wholly outside the state using the bed and banks of a watercourse? TWC § 11.042(a-1). Y / N **N**

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps and fees from the list below.*

- c. Applicant requests to convey Applicant's own return flows derived from privately owned groundwater using the bed and banks of a watercourse? TWC § 11.042(b). Y / N **N**

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.*

- d. Applicant requests to convey Applicant's own return flows derived from surface water using the bed and banks of a watercourse? TWC § 11.042(c). Y / N **N**

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, Maps, and fees from the list below.*

***\*Please note, if Applicant requests the reuse of return flows belonging to others, the Applicant will need to submit the worksheets and documents under Section 1 above, as the application will be treated as a new appropriation subject to termination upon direct or indirect reuse by the return flow discharger/owner.***

- e. Applicant requests to convey water from any other source, other than (a)-(d) above, using the bed and banks of a watercourse? TWC § 11.042(c). Y / N **N**

*If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.*

*Worksheets and information:*

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir owned by the applicant through which water will be conveyed or diverted)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for the downstream limit of each diversion reach for the proposed conveyances)
- **Worksheet 4.0 – Discharge Information Worksheet** (for each discharge point)
- **Worksheet 5.0 – Environmental Information Worksheet**
- **Worksheet 6.0 – Water Conservation Information Worksheet**
- **Worksheet 7.0 – Accounting Plan Information Worksheet**
- **Worksheet 8.0 – Calculation of Fees; and Fees calculated – see instructions Page. 34**
- **Maps – See instructions Page. 15.**
- **Additional Documents and Worksheets may be required (see within).**



#### 4. General Information, Response Required for all Water Right Applications (Instructions, Page 15)

- a. Provide information describing how this application addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement (*not required for applications to use groundwater-based return flows*). Include citations or page numbers for the State and Regional Water Plans, if applicable. Provide the information in the space below or submit a supplemental sheet entitled "Addendum Regarding the State and Regional Water Plans":

This application is consistent with the 2017 State Water Plan and 2016 Region H

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Regional Water Plan. The run-of-river supplies authorized by CA 12-5322 were

---

accounted for as part of existing supplies in the Regional Water Plan. The proposed

---

amendments do not increase permitted supply volume, but instead add flexibility to the

---

GCWA system, supporting GCWA's ability to match supply with demand.

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- b. Did the Applicant perform its own Water Availability Analysis? Y / N Y

*If the Applicant performed its own Water Availability Analysis, provide electronic copies of any modeling files and reports.*

- C. Does the application include required Maps? (Instructions Page. 15) Y / N Y

# WORKSHEET 1.0

## Quantity, Purpose and Place of Use

### 1. New Authorizations (Instructions, Page. 16)

Submit the following information regarding quantity, purpose and place of use for requests for new or additional appropriations of State Water or Bed and Banks authorizations:

Quantity (acre- feet) <i>(Include losses for Bed and Banks)</i>	State Water Source (River Basin) or Alternate Source <i>*each alternate source (and new appropriation based on return flows of others) also requires completion of Worksheet 4.0</i>	Purpose(s) of Use	Place(s) of Use <i>*requests to move state water out of basin also require completion of Worksheet 1.1 Interbasin Transfer</i>
N/A	N/A	N/A	N/A

N/A Total amount of water (in acre-feet) to be used annually (*include losses for Bed and Banks applications*)

If the Purpose of Use is Agricultural/Irrigation for any amount of water, provide:

#### 1. Location Information Regarding the Lands to be Irrigated

i) Applicant proposes to irrigate a total of N/A acres in any one year. This acreage is all of or part of a larger tract(s) which is described in a supplement attached to this application and contains a total of N/A acres in N/A County, TX.

ii) Location of land to be irrigated: In the N/A Original Survey No. N/A, Abstract No. N/A.

***A copy of the deed(s) or other acceptable instrument describing the overall tract(s) with the recording information from the county records must be submitted. Applicant's name must match deeds.***

***If the Applicant is not currently the sole owner of the lands to be irrigated, Applicant must submit documentation evidencing consent or other documentation supporting Applicant's right to use the land described.***

***Water Rights for Irrigation may be appurtenant to the land irrigated and convey with the land unless reserved in the conveyance. 30 TAC § 297.81.***



## 2. Amendments - Purpose or Place of Use (Instructions, Page. 12)

- a. Complete this section for each requested amendment changing, adding, or removing Purpose(s) or Place(s) of Use, complete the following:

Quantity (acre-feet)	Existing Purpose(s) of Use	Proposed Purpose(s) of Use*	Existing Place(s) of Use	Proposed Place(s) of Use**
155,000	Irrigation, Municipal, Industrial	Irrigation, Municipal, Industrial, Mining	Brazoria, Fort Bend, Galveston, and Harris Counties	Brazoria, Fort Bend, Galveston, and Harris Counties

\*If the request is to add additional purpose(s) of use, include the existing and new purposes of use under "Proposed Purpose(s) of Use."

\*\*If the request is to add additional place(s) of use, include the existing and new places of use under "Proposed Place(s) of Use."

*Changes to the purpose of use in the Rio Grande Basin may require conversion. 30 TAC § 303.43.*

- b. For any request which adds Agricultural purpose of use or changes the place of use for Agricultural rights, provide the following location information regarding the lands to be irrigated:
- Applicant proposes to irrigate a total of N/A acres in any one year. This acreage is all of or part of a larger tract(s) which is described in a supplement attached to this application and contains a total of N/A acres in N/A County, TX.
  - Location of land to be irrigated: In the N/A Original Survey No. N/A, Abstract No. N/A.  
*A copy of the deed(s) describing the overall tract(s) with the recording information from the county records must be submitted. Applicant's name must match deeds. If the Applicant is not currently the sole owner of the lands to be irrigated, Applicant must submit documentation evidencing consent or other legal right for Applicant to use the land described.*
- Water Rights for Irrigation may be appurtenant to the land irrigated and convey with the land unless reserved in the conveyance. 30 TAC § 297.81.*
- Submit Worksheet 1.1, Interbasin Transfers, for any request to change the place of use which moves State Water to another river basin.
  - See Worksheet 1.2, Marshall Criteria, and submit if required.
  - See Worksheet 6.0, Water Conservation/Drought Contingency, and submit if required.

# WORKSHEET 1.1

## INTERBASIN TRANSFERS, TWC § 11.085

Submit this worksheet for an application for a new or amended water right which requests to transfer State Water from its river basin of origin to use in a different river basin. A river basin is defined and designated by the Texas Water Development Board by rule pursuant to TWC § 16.051.

Applicant requests to transfer State Water to another river basin within the State? Y / N

### 1. Interbasin Transfer Request (Instructions, Page. 20)

- Provide the Basin of Origin. Brazos River Basin
- Provide the quantity of water to be transferred (acre-feet). 155,000
- Provide the Basin(s) and count(y/ies) where use will occur in the space below:  
Brazos Basin and San Jacinto Brazos Coastal Basin; Brazoria, Fort Bend, Galveston, and Harris Counties

### 2. Exemptions (Instructions, Page. 20), TWC § 11.085(v)

Certain interbasin transfers are exempt from further requirements. Answer the following:

- The proposed transfer, which in combination with any existing transfers, totals less than 3,000 acre-feet of water per annum from the same water right. Y/N N
- The proposed transfer is from a basin to an adjoining coastal basin? Y/N Y
- The proposed transfer from the part of the geographic area of a county or municipality, or the part of the retail service area of a retail public utility as defined by Section 13.002, that is within the basin of origin for use in that part of the geographic area of the county or municipality, or that contiguous part of the retail service area of the utility, not within the basin of origin? Y/N Y
- The proposed transfer is for water that is imported from a source located wholly outside the boundaries of Texas, except water that is imported from a source located in the United Mexican States? Y/N N

### 3. Interbasin Transfer Requirements (Instructions, Page. 20)

For each Interbasin Transfer request that is not exempt under any of the exemptions listed above Section 2, provide the following information in a supplemental attachment titled "Addendum to Worksheet 1.1, Interbasin Transfer":

- the contract price of the water to be transferred (if applicable) (also include a copy of the contract or adopted rate for contract water);
- a statement of each general category of proposed use of the water to be transferred and a detailed description of the proposed uses and users under each category;
- the cost of diverting, conveying, distributing, and supplying the water to, and treating the water for, the proposed users (example - expert plans and/or reports documents may be provided to show the cost);



- d. describe the need for the water in the basin of origin and in the proposed receiving basin based on the period for which the water supply is requested, but not to exceed 50 years (the need can be identified in the most recently approved regional water plans. The state and regional water plans are available for download at this website: (<http://www.twdb.texas.gov/waterplanning/swp/index.asp>);
- e. address the factors identified in the applicable most recently approved regional water plans which address the following:
  - (i) the availability of feasible and practicable alternative supplies in the receiving basin to the water proposed for transfer;
  - (ii) the amount and purposes of use in the receiving basin for which water is needed;
  - (iii) proposed methods and efforts by the receiving basin to avoid waste and implement water conservation and drought contingency measures;
  - (iv) proposed methods and efforts by the receiving basin to put the water proposed for transfer to beneficial use;
  - (v) the projected economic impact that is reasonably expected to occur in each basin as a result of the transfer; and
  - (vi) the projected impacts of the proposed transfer that are reasonably expected to occur on existing water rights, instream uses, water quality, aquatic and riparian habitat, and bays and estuaries that must be assessed under Sections 11.147, 11.150, and 11.152 in each basin (*if applicable*). If the water sought to be transferred is currently authorized to be used under an existing permit, certified filing, or certificate of adjudication, such impacts shall only be considered in relation to that portion of the permit, certified filing, or certificate of adjudication proposed for transfer and shall be based on historical uses of the permit, certified filing, or certificate of adjudication for which amendment is sought;
- (f) proposed mitigation or compensation, if any, to the basin of origin by the applicant; and
- (g) the continued need to use the water for the purposes authorized under the existing Permit, Certified Filing, or Certificate of Adjudication, if an amendment to an existing water right is sought.



## WORKSHEET 1.2

### NOTICE. "THE MARSHALL CRITERIA"

This worksheet assists the Commission in determining notice required for certain **amendments** that do not already have a specific notice requirement in a rule for that type of amendment, and *that do not change the amount of water to be taken or the diversion rate*. The worksheet provides information that Applicant **is required** to submit for such amendments which include changes in use, changes in place of use, or other non-substantive changes in a water right (such as certain amendments to special conditions or changes to off-channel storage). These criteria address whether the proposed amendment will impact other water right holders or the on-stream environment beyond and irrespective of the fact that the water right can be used to its full authorized amount.

*This worksheet is **not required** for Applications in the Rio Grande Basin requesting changes in the purpose of use, rate of diversion, point of diversion, and place of use for water rights held in and transferred within and between the mainstems of the Lower Rio Grande, Middle Rio Grande, and Amistad Reservoir. See 30 TAC § 303.42.*

*This worksheet is **not required** for amendments which are only changing or adding diversion points, or request only a bed and banks authorization or an IBT authorization. However, Applicants may wish to submit the Marshall Criteria to ensure that the administrative record includes information supporting each of these criteria*

#### 1. The "Marshall Criteria" (Instructions, Page. 21)

Submit responses on a supplemental attachment titled "Marshall Criteria" in a manner that conforms to the paragraphs (a) – (g) below:

- a. Administrative Requirements and Fees. Confirm whether application meets the administrative requirements for an amendment to a water use permit pursuant to TWC Chapter 11 and Title 30 Texas Administrative Code (TAC) Chapters 281, 295, and 297. An amendment application should include, but is not limited to, a sworn application, maps, completed conservation plan, fees, etc.
- b. Beneficial Use. Discuss how proposed amendment is a beneficial use of the water as defined in TWC § 11.002 and listed in TWC § 11.023. Identify the specific proposed use of the water (e.g., road construction, hydrostatic testing, etc.) for which the amendment is requested.
- c. Public Welfare. Explain how proposed amendment is not detrimental to the public welfare. Consider any public welfare matters that might be relevant to a decision on the application. Examples could include concerns related to the well-being of humans and the environment.
- d. Groundwater Effects. Discuss effects of proposed amendment on groundwater or groundwater recharge.

- e. State Water Plan. Describe how proposed amendment addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement. The state and regional water plans are available for download at:  
<http://www.twdb.texas.gov/waterplanning/swp/index.asp>.
- f. Waste Avoidance. Provide evidence that reasonable diligence will be used to avoid waste and achieve water conservation as defined in TWC § 11.002. Examples of evidence could include, but are not limited to, a water conservation plan or, if required, a drought contingency plan, meeting the requirements of 30 TAC Chapter 288.
- g. Impacts on Water Rights or On-stream Environment. Explain how proposed amendment will not impact other water right holders or the on-stream environment beyond and irrespective of the fact that the water right can be used to its full authorized amount.



# WORKSHEET 3.0

## DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. GCWA Point #1a Upstream Limit of Diversion Reach No.
3. N/A Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** 900 cfs (cubic feet per second)  
or 405,000 gpm (gallons per minute)

c. Does this point share a diversion rate with other points? **Y / N Y**  
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* 900 cfs or 405,000 gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N N**

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N N**

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77406
- c. Location of point: In the Churchill Fulshear Grant Original Survey No. N/A, Abstract No. 29, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.646246°N, Longitude 95.902433°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

- a. This Worksheet is to add new (select 1 of 3 below):
1. N/A Diversion Point No.
  2. N/A Upstream Limit of Diversion Reach No.
  3. GCWA Point #1b Downstream Limit of Diversion Reach No.
- b. Maximum Rate of Diversion for **this new point** 900 cfs (cubic feet per second)  
or 405,000 gpm (gallons per minute)
- c. Does this point share a diversion rate with other points? **Y / N Y**  
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* 900 cfs or 405,000 gpm
- d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N N**

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

- e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

- f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N N**

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*



## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77406
- c. Location of point: In the Churchill Fulshear Grant Original Survey No. N/A, Abstract No. 29, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.639849°N, Longitude 95.902108°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A

## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

- a. This Worksheet is to add new (select 1 of 3 below):
1. N/A Diversion Point No.
  2. GCWA Point #2a Upstream Limit of Diversion Reach No.
  3. N/A Downstream Limit of Diversion Reach No.
- b. Maximum Rate of Diversion for **this new point** 900 cfs (cubic feet per second)  
or 405,000 gpm (gallons per minute)
- c. Does this point share a diversion rate with other points? **Y / N Y**  
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* 900 cfs or 405,000 gpm

- d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N N**

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

- e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

- f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N N**

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77459
- c. Location of point: In the Thomas Barnett Grant Original Survey No. N/A, Abstract No. 7, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.504260°N, Longitude 95.554535°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. N/A Upstream Limit of Diversion Reach No.
3. GCWA Point #2b Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** 900 cfs (cubic feet per second)  
or 405,000 gpm (gallons per minute)

c. Does this point share a diversion rate with other points? **Y / N** **Y**  
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* 900 cfs or 405,000 gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N** **N**

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N** **N**

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77459
- c. Location of point: In the Thomas Barnett Grant Original Survey No. N/A, Abstract No. 7, Fort Bend County, Texas.

*A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.*

- d. Point is at:  
Latitude 29.503100°N, Longitude 95.552670°W.  
*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

- a. This Worksheet is to add new (select 1 of 3 below):
  1. N/A Diversion Point No.
  2. GCWA Point #3a Upstream Limit of Diversion Reach No.
  3. N/A Downstream Limit of Diversion Reach No.
- b. Maximum Rate of Diversion for **this new point** 900 cfs (cubic feet per second)  
or 405,000 gpm (gallons per minute)
- c. Does this point share a diversion rate with other points? **Y / N Y**  
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* 900 cfs or 405,000 gpm
- d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N N**  
  
*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*
- e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

- f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N N**

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77583
- c. Location of point: In the William Pettus Grant Original Survey No. N/A, Abstract No. 68, Fort Bend County, Texas.

***A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.***

- d. Point is at:  
Latitude 29.458280°N, Longitude 95.532463°W.  
***Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places***
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A



## WORKSHEET 3.0

### DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet is **required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

*The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).*

#### 1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. N/A Diversion Point No.
2. N/A Upstream Limit of Diversion Reach No.
3. GCWA Point #3b Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** 900 cfs (cubic feet per second)  
or 405,000 gpm (gallons per minute)

c. Does this point share a diversion rate with other points? **Y / N Y**  
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* 900 cfs or 405,000 gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N N**

*\*\* An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (✓) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
<input checked="" type="checkbox"/>	Directly from stream	Existing
<input type="checkbox"/>	From an on-channel reservoir	
<input type="checkbox"/>	From a stream to an on-channel reservoir	
<input type="checkbox"/>	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N N**

If yes, the drainage area is N/A sq. miles.

*(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691, prior to submitting application)*

## 2. Diversion Location (Instructions, Page 25)

- a. On watercourse (USGS name): Brazos River
- b. Zip Code: 77583
- c. Location of point: In the William Pettus Grant Original Survey No. N/A, Abstract No. 68, Fort Bend County, Texas.

***A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.***

- d. Point is at:  
Latitude 29.455035°N, Longitude 95.532936°W.  
***Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places***
- e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GIS
- f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38.
- g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

N/A



## WORKSHEET 4.0

### DISCHARGE INFORMATION

This worksheet required for any requested authorization to discharge water into a State Watercourse for conveyance and later withdrawal or in-place use. Worksheet 4.1 is also required for each Discharge point location requested. **Instructions Page. 26. Applicant is responsible for obtaining any separate water quality authorizations which may be required and for insuring compliance with TWC, Chapter 26 or any other applicable law.**

- a. The purpose of use for the water being discharged will be Municipal, Industrial, Irrigation, Mining.
- b. Provide the amount of water that will be lost to transportation, evaporation, seepage, channel or other associated carriage losses 20% and explain the method of calculation: Losses from study performed for GCWA. Rate is conservative estimate for the 75 mile long GCWA American Canal system, which includes approximately 42 miles of state watercourse.

Is the source of the discharged water return flows? **Y / N<sup>N</sup>** If yes, provide the following information: **N/A**

1. The TPDES Permit Number(s). N/A (attach a copy of the **current** TPDES permit(s))
2. Applicant is the owner/holder of each TPDES permit listed above? **Y / N** **N/A**

*PLEASE NOTE: If Applicant is not the discharger of the return flows, the application should be submitted under Section 1, New or Additional Appropriation of State Water, as a request for a new appropriation of state water. If Applicant is the discharger, then the application should be submitted under Section 3, Bed and Banks.*

3. Monthly WWTP discharge data for the past 5 years in electronic format. (Attach and label as "Supplement to Worksheet 4.0").
  4. The percentage of return flows from groundwater N/A, surface water N/A?
  5. If any percentage is surface water, provide the base water right number(s) N/A.
- c. Is the source of the water being discharged groundwater? **Y / N<sup>N</sup>** If yes, provide the following information: **N/A**
1. Source aquifer(s) from which water will be pumped: N/A
  2. Any 24 hour pump test for the well if one has been conducted. If the well has not been constructed, provide production information for wells in the same aquifer in the area of the application. See <http://www.twdb.texas.gov/groundwater/data/gwdbbrpt.asp>. Additionally, provide well numbers or identifiers N/A.
  3. Indicate how the groundwater will be conveyed to the stream or reservoir. **N/A**
  4. A copy of the groundwater well permit if it is located in a Groundwater Conservation District (GCD) or evidence that a groundwater well permit is not required.
- ci. Is the source of the water being discharged a surface water supply contract? **Y / N** **Y**  
If yes, provide the signed contract(s).
- cii. Identify any other source of the water Certificates of Adjudication 12-5168, 12-5171, 12-5322, and alternate sources.



## WORKSHEET 4.1

### DISCHARGE POINT INFORMATION

This worksheet is required for **each** discharge point. Submit one Worksheet 4.1 for each discharge point. If there is more than one discharge point, the numbering of the points should be consistent throughout the application and on any supplemental documents (e.g. maps).  
**Instructions, Page 27.**

**For water discharged at this location provide:**

- a. The amount of water that will be discharged at this point is up to 155,000 acre-feet per year. The discharged amount should include the amount needed for use and to compensate for any losses.
- b. Water will be discharged at this point at a maximum rate of 900 cfs or 405,000 gpm.
- c. Name of Watercourse as shown on Official USGS maps: Jones and Oyster Creeks
- d. Zip Code: 77406
- f. Location of point: In the Churchill Fulshear Grant Original Survey No. N/A, Abstract No. 29, Fort Bend County, Texas.
- g. Point is at:  
Latitude 29.644986 °N, Longitude 95.901483 °W.  
*\*Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places*
- h. Indicate the method used to calculate the discharge point location (examples: Handheld GPS Device, GIS, Mapping Program): GIS

**Map submitted must clearly identify each discharge point. See instructions Page. 15.**

## WORKSHEET 5.0

### ENVIRONMENTAL INFORMATION

This worksheet is required for new appropriations of water in the Canadian, Red, Sulphur, and Cypress Creek Basins. The worksheet is also required in all basins for: requests to change a diversion point, applications using an alternate source of water, and bed and banks applications. **Instructions, Page 28.**

#### **1. New Appropriations of Water (Canadian, Red, Sulphur, and Cypress Creek Basins only) and Changes in Diversion Point(s)**

Description of the Water Body at each Diversion Point or Dam Location. (Provide an Environmental Information Sheet for each location),

a. Identify the appropriate description of the water body.

☒ Stream

☐ Reservoir

Average depth of the entire water body, in feet: \_\_\_\_\_

☐ Other, specify: \_\_\_\_\_

b. Flow characteristics

If a stream, was checked above, provide the following. For new diversion locations, check one of the following that best characterize the area downstream of the diversion (check one).

☐ Intermittent - dry for at least one week during most years

☐ Intermittent with Perennial Pools - enduring pools

☒ Perennial - normally flowing

Check the method used to characterize the area downstream of the new diversion location.

☒ USGS flow records

☐ Historical observation by adjacent landowners

☐ Personal observation

☐ Other, specify: \_\_\_\_\_

c. Waterbody aesthetics

Check one of the following that best describes the aesthetics of the stream segments affected by the application and the area surrounding those stream segments.

- ☐ Wilderness: outstanding natural beauty; usually wooded or ungrazed area; water clarity exceptional
- ☒ Natural Area: trees and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored
- ☐ Common Setting: not offensive; developed but uncluttered; water may be colored or turbid
- ☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

#### d. Waterbody Recreational Uses

Are there any known recreational uses of the stream segments affected by the application?

- ☐ Primary contact recreation (swimming or direct contact with water)
- ☒ Secondary contact recreation (fishing, canoeing, or limited contact with water)
- ☐ Non-contact recreation

Submit the following information in a Supplemental Attachment, labeled Addendum to Worksheet 5.0:

1. Photographs of the stream at the diversion point or dam location. Photographs should be in color and show the proposed point or reservoir and upstream and downstream views of the stream, including riparian vegetation along the banks. Include a description of each photograph and reference the photograph to the map submitted with the application indicating the location of the photograph and the direction of the shot.
2. Measures the applicant will take to avoid impingement and entrainment of aquatic organisms (ex. Screens on the new diversion structure).
3. If the application includes a proposed reservoir, also include:
  - i. A brief description of the area that will be inundated by the reservoir.
  - ii. If a United States Army Corps of Engineers (USACE) 404 permit is required, provide the project number and USACE project manager.
  - iii. A description of how any impacts to wetland habitat, if any, will be mitigated if the reservoir is greater than 5,000 acre-feet.

## 2. Alternate Sources of Water and/or Bed and Banks Applications

For all bed and banks applications:

- a. Indicate the measures the applicant will take to avoid impingement and entrainment of aquatic organisms (ex. Screens on the new diversion structure).



- b. An assessment of the adequacy of the quantity and quality of flows remaining after the proposed diversion to meet instream uses and bay and estuary freshwater inflow requirements.

If the alternate source is treated return flows, provide the TPDES permit number N/A

If groundwater is the alternate source, or groundwater or other surface water will be discharged into a watercourse provide:

- a. Reasonably current water chemistry information including but not limited to the following parameters in the table below. Additional parameters may be requested if there is a specific water quality concern associated with the aquifer from which water is withdrawn. If data for onsite wells are unavailable; historical data collected from similar sized wells drawing water from the same aquifer may be provided. However, onsite data may still be required when it becomes available. Provide the well number or well identifier. Complete the information below for each well and provide the Well Number or identifier.

Parameter	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
Sulfate, mg/L	N/A	N/A	N/A	N/A	N/A
Chloride, mg/L	N/A	N/A	N/A	N/A	N/A
Total Dissolved Solids, mg/L	N/A	N/A	N/A	N/A	N/A
pH, standard units	N/A	N/A	N/A	N/A	N/A
Temperature*, degrees Celsius	N/A	N/A	N/A	N/A	N/A

\* Temperature must be measured onsite at the time the groundwater sample is collected.

- b. If groundwater will be used, provide the depth of the well N/A and the name of the aquifer from which water is withdrawn N/A.

# WORKSHEET 6.0

## Water Conservation/Drought Contingency Plans

This form is intended to assist applicants in determining whether a Water Conservation Plan and/or Drought Contingency Plans is required and to specify the requirements for plans.  
**Instructions, Page 31.**

*The TCEQ has developed guidance and model plans to help applicants prepare plans. Applicants may use the model plan with pertinent information filled in. For assistance submitting a plan call the Resource Protection Team (Water Conservation staff) at 512-239-4691, or e-mail [wras@tceq.texas.gov](mailto:wras@tceq.texas.gov). The model plans can also be downloaded from the TCEQ webpage. Please use the most up-to-date plan documents available on the webpage.*

### 1. Water Conservation Plans

- a. The following applications must include a completed Water Conservation Plan (30 TAC § 295.9) for each use specified in 30 TAC, Chapter 288 (municipal, industrial or mining, agriculture – including irrigation, wholesale):

1. Request for a new appropriation or use of State Water.
2. Request to amend water right to increase appropriation of State Water.
3. Request to amend water right to extend a term.
4. Request to amend water right to change a place of use.  
*\*does not apply to a request to expand irrigation acreage to adjacent tracts.*
5. Request to amend water right to change the purpose of use.  
*\*applicant need only address new uses.*
6. Request for bed and banks under TWC § 11.042(c), when the source water is State Water  
*\*including return flows, contract water, or other State Water.*

- b. If Applicant is requesting any authorization in section (1)(a) above, indicate each use for which Applicant is submitting a Water Conservation Plan as an attachment:

1. \_\_\_\_ Municipal Use. See 30 TAC § 288.2. \*\*
2. \_\_\_\_ Industrial or Mining Use. See 30 TAC § 288.3.
3. \_\_\_\_ Agricultural Use, including irrigation. See 30 TAC § 288.4.
4. ☒ Wholesale Water Suppliers. See 30 TAC § 288.5. \*\*

**\*\*If Applicant is a water supplier, Applicant must also submit documentation of adoption of the plan. Documentation may include an ordinance, resolution, or tariff, etc. See 30 TAC §§ 288.2(a)(1)(J)(i) and 288.5(1)(H). Applicant has submitted such documentation with each water conservation plan? Y / N **Y****

- c. Water conservation plans submitted with an application must also include data and information which: supports applicant's proposed use with consideration of the plan's water conservation goals; evaluates conservation as an alternative to the proposed



appropriation; and evaluates any other feasible alternative to new water development.  
See 30 TAC § 288.7.

Applicant has included this information in each applicable plan? Y / N **N/A**

## 2. Drought Contingency Plans

- a. A drought contingency plan is also required for the following entities if Applicant is requesting any of the authorizations in section (1) (a) above - indicate each that applies:
  - 1. \_\_\_\_ Municipal Uses by public water suppliers. See 30 TAC § 288.20.
  - 2. \_\_\_\_ Irrigation Use/ Irrigation water suppliers. See 30 TAC § 288.21.
  - 3. **X** \_\_\_\_ Wholesale Water Suppliers. See 30 TAC § 288.22.
- b. If Applicant must submit a plan under section 2(a) above, Applicant has also submitted documentation of adoption of drought contingency plan (*ordinance, resolution, or tariff, etc. See 30 TAC § 288.30*) Y / N **Y**

# WORKSHEET 7.0

## ACCOUNTING PLAN INFORMATION WORKSHEET

The following information provides guidance on when an Accounting Plan may be required for certain applications and if so, what information should be provided. An accounting plan can either be very simple such as keeping records of gage flows, discharges, and diversions; or, more complex depending on the requests in the application. Contact the Surface Water Availability Team at 512-239-4691 for information about accounting plan requirements, if any, for your application. **Instructions, Page 34.**

### 1. Is Accounting Plan Required

Accounting Plans are generally required:

- For applications that request authorization to divert large amounts of water from a single point where multiple diversion rates, priority dates, and water rights can also divert from that point;
- For applications for new major water supply reservoirs;
- For applications that amend a water right where an accounting plan is already required, if the amendment would require changes to the accounting plan;
- For applications with complex environmental flow requirements;
- For applications with an alternate source of water where the water is conveyed and diverted; and
- For reuse applications.

### 2. Accounting Plan Requirements

- a. A **text file** that includes:
  1. an introduction explaining the water rights and what they authorize;
  2. an explanation of the fields in the accounting plan spreadsheet including how they are calculated and the source of the data;
  3. for accounting plans that include multiple priority dates and authorizations, a section that discusses how water is accounted for by priority date and which water is subject to a priority call by whom; and
  4. Should provide a summary of all sources of water.
- b. A **spreadsheet** that includes:
  1. Basic daily data such as diversions, deliveries, compliance with any instream flow requirements, return flows discharged and diverted and reservoir content;
  2. Method for accounting for inflows if needed;
  3. Reporting of all water use from all authorizations, both existing and proposed;
  4. An accounting for all sources of water;
  5. An accounting of water by priority date;
  6. For bed and banks applications, the accounting plan must track the discharged water from the point of delivery to the final point of diversion;
  7. Accounting for conveyance losses;
  8. Evaporation losses if the water will be stored in or transported through a reservoir. Include changes in evaporation losses and a method for measuring reservoir content resulting from the discharge of additional water into the reservoir;
  9. An accounting for spills of other water added to the reservoir; and
  10. Calculation of the amount of drawdown resulting from diversion by junior rights or diversions of other water discharged into and then stored in the reservoir.



## WORKSHEET 8.0 CALCULATION OF FEES

This worksheet is for calculating required application fees. Applications are not Administratively Complete until all required fees are received. **Instructions, Page. 34**

### 1. NEW APPROPRIATION

	Description	Amount (\$)
<b>Filing Fee</b>	Circle fee correlating to the total amount of water* requested for any new appropriation and/or impoundment. Amount should match total on Worksheet 1, Section 1. Enter corresponding fee under <b>Amount (\$)</b> . <u>In Acre-Feet</u> a. Less than 100 \$100.00 b. 100 - 5,000 \$250.00 c. 5,001 - 10,000 \$500.00 d. 10,001 - 250,000 \$1,000.00 e. More than 250,000 \$2,000.00	N/A
<b>Recording Fee</b>		\$25.00
<b>Agriculture Use Fee</b>	<i>Only for those with an Irrigation Use.</i> Multiply 50¢ x <u>N/A</u> Number of acres that will be irrigated with State Water. **	N/A
<b>Use Fee</b>	<i>Required for all Use Types, excluding Irrigation Use.</i> Multiply \$1.00 x <u>N/A</u> Maximum annual diversion of State Water in acre-feet. **	N/A
<b>Recreational Storage Fee</b>	<i>Only for those with Recreational Storage.</i> Multiply \$1.00 x <u>N/A</u> acre-feet of in-place Recreational Use State Water to be stored at normal max operating level.	N/A
<b>Storage Fee</b>	<i>Only for those with Storage, excluding Recreational Storage.</i> Multiply 50¢ x <u>N/A</u> acre-feet of State Water to be stored at normal max operating level.	N/A
<b>Mailed Notice</b>	Cost of mailed notice to all water rights in the basin. Contact Staff to determine the amount (512) 239-4691.	N/A
<b>TOTAL</b>		<b>\$ N/A</b>

### 2. AMENDMENT OR SEVER AND COMBINE

	Description	Amount (\$)
<b>Filing Fee</b>	Amendment: \$100	\$100
	OR Sever and Combine: \$100 x <u>N/A</u> of water rights to combine	N/A
<b>Recording Fee</b>		\$12.50
<b>Mailed Notice</b>	Additional notice fee to be determined once application is submitted.	
<b>TOTAL INCLUDED</b>		<b>\$ 112.50</b>

### 3. BED AND BANKS

	Description	Amount (\$)
<b>Filing Fee</b>		\$100.00
<b>Recording Fee</b>		\$12.50
<b>Mailed Notice</b>	Additional notice fee to be determined once application is submitted.	
<b>TOTAL INCLUDED</b>		<b>\$ 112.50</b>



**SUPPLEMENT TO APPLICATIONS FOR  
WATER RIGHT AMENDMENTS FOR DIVERSION FROM  
THE BRAZOS RIVER**

Prepared for:

**Gulf Coast Water Authority**

October 2018

Prepared by:

**FREESE AND NICHOLS, INC.**  
10497 Town and Country Way, Suite 600  
Houston, Texas 77024  
713-600-6800



## **SUPPLEMENT TO APPLICATIONS FOR WATER RIGHT AMENDMENTS FOR DIVERSION FROM THE BRAZOS RIVER**



Prepared by:

**FREESE AND NICHOLS, INC.**  
10497 Town and Country Way, Suite 600  
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713-600-6800

GCW18193

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## **LIST OF ATTACHMENTS**

- Attachment 1: GCWA Diversion Location Maps
- Attachment 2: Certificate of Adjudication 12-5322, As Amended
- Attachment 3: GCWA Contracts to Other Entities (Addendum to Worksheet 1.0)
- Attachment 4: Marshall Criteria (Addendum to Worksheet 1.2)
- Attachment 5: Diversion Point Access Documentation (Addendum to Worksheet 3.0)
- Attachment 6: Canal Documentation
- Attachment 7: Diversion Point Photographs and Supporting Information (Addendum to Worksheet 5.0)
- Attachment 8: GCWA Water Conservation Plan (Addendum to Worksheet 6.0)
- Attachment 9: GCWA Drought Contingency Plan (Addendum to Worksheet 6.0)
- Attachment 10: Water Right Accounting Plan Report (Addendum to Worksheet 7.0)
- Attachment 11: Irrigation Language Applicant Requests Be Removed
- Attachment 12: WAM Modeling and No Injury Analysis
- Attachment 13: Signatory Authority

## **1.0 DESCRIPTION OF THE PROJECT**

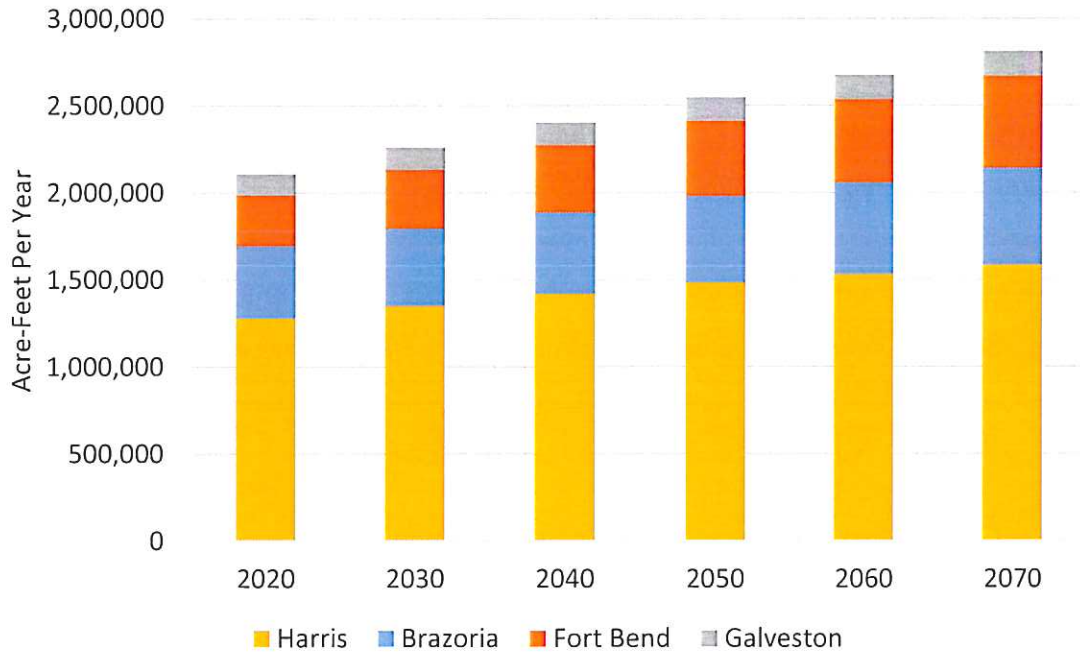
### **1.1 SUMMARY OF WATER RIGHTS AND INFRASTRUCTURE**

Gulf Coast Water Authority (GCWA) holds three Certificates of Adjudication (CA) that authorize a total of 379,932 acre-feet per year of diversion from the Brazos River: CA 12-5168, CA 12-5171, and CA 12-5322. GCWA is seeking amendments to its Brazos River water rights to increase flexibility in how these supplies may be utilized. GCWA serves as a water supplier for a broad range of entities in Galveston, Brazoria, Harris, and Fort Bend Counties. In addition to providing potable and raw water to municipal entities, GCWA provides water supply to agriculture and to industrial customers in multiple sectors. According to the 2016 Region H Regional Water Plan (RWP) and the 2017 State Water Plan (SWP), demands in the four-county area served by GCWA are expected to increase from 2.1 million acre-feet per year in 2020 to 2.8 million acre-feet per year by 2070 (Figure 1-1). GCWA, as one of the major water suppliers in the region, is anticipated to play a key role in meeting a portion of that growing demand with its run-of-river supplies. The proposed amendments do not increase the permitted supply volume or maximum diversion rate for each right, but instead will increase the operational flexibility of the GCWA system, enabling GCWA to more reliably meet the needs of the customers that depend on it for water supply.

Table 1-1 summarizes the currently authorized diversion, storage, and priority dates in these water rights (shown in black) as well as the use type and diversion location additions sought by these amendments (shown in red). The amendments seek to allow diversion of any portion of any of these three rights at any of GCWA's three diversion locations on the river for municipal, industrial, irrigation, and mining uses, subject to applicable permit conditions and any active priority calls. These and other proposed amendments are described in greater detail in Section 1.2. Figure 1-2 is an overview map showing the location of the three diversion points. Detailed reference maps of relevant project features, including canals, existing diversion locations, and proposed diversion reach limits are included in Attachment 1 to this report.



**Figure 1-1: Projected Demands in Lower Basin Counties**



**Table 1-1: Gulf Coast Water Authority Water Rights and Proposed Amendments**

CA Number	Priority Date	Current Authorized Use Type	Proposed Additional Type	Current Diversion Points	Proposed Additional Point	Diversion Amounts (Ac-Ft)	Storage (Ac-Ft)
CA 12-5168	Jan 15, 1926	Municipal, Industrial, Irrigation	Mining	#1, #2	#3	99,932	7,308
CA 12-5171	Feb 1, 1939	Municipal, Industrial, Mining	Irrigation	#1, #2	#3	75,000	None
	Dec 12, 1950	Irrigation	Municipal, Industrial, Mining	#1, #2	#3	50,000	None
CA 12-5322*	Feb 8, 1929	Municipal, Irrigation Industrial	Mining	#2, #3	#1	40,000	864
	Mar 14, 1955	Municipal, Irrigation Industrial	Mining	#2, #3	#1	40,000	None
	Jul 25, 1983	Municipal, Irrigation Industrial	Mining	#2, #3	#1	75,000	None
<b>Total</b>						<b>379,932</b>	<b>8,172</b>

\*Diversion of CA 12-5322 at GCWA Point #2 (GCWA Briscoe pump station) was authorized by Paragraph 2 of Amendment E to CA 12-5322, granted January 7, 2011. Pursuant to Paragraph 5 of Amendment E, prior to diversion of CA 12-5322 at GCWA Point #2 the owner must apply for and be granted an amendment for approval of a daily Accounting Plan (See Attachment 2).

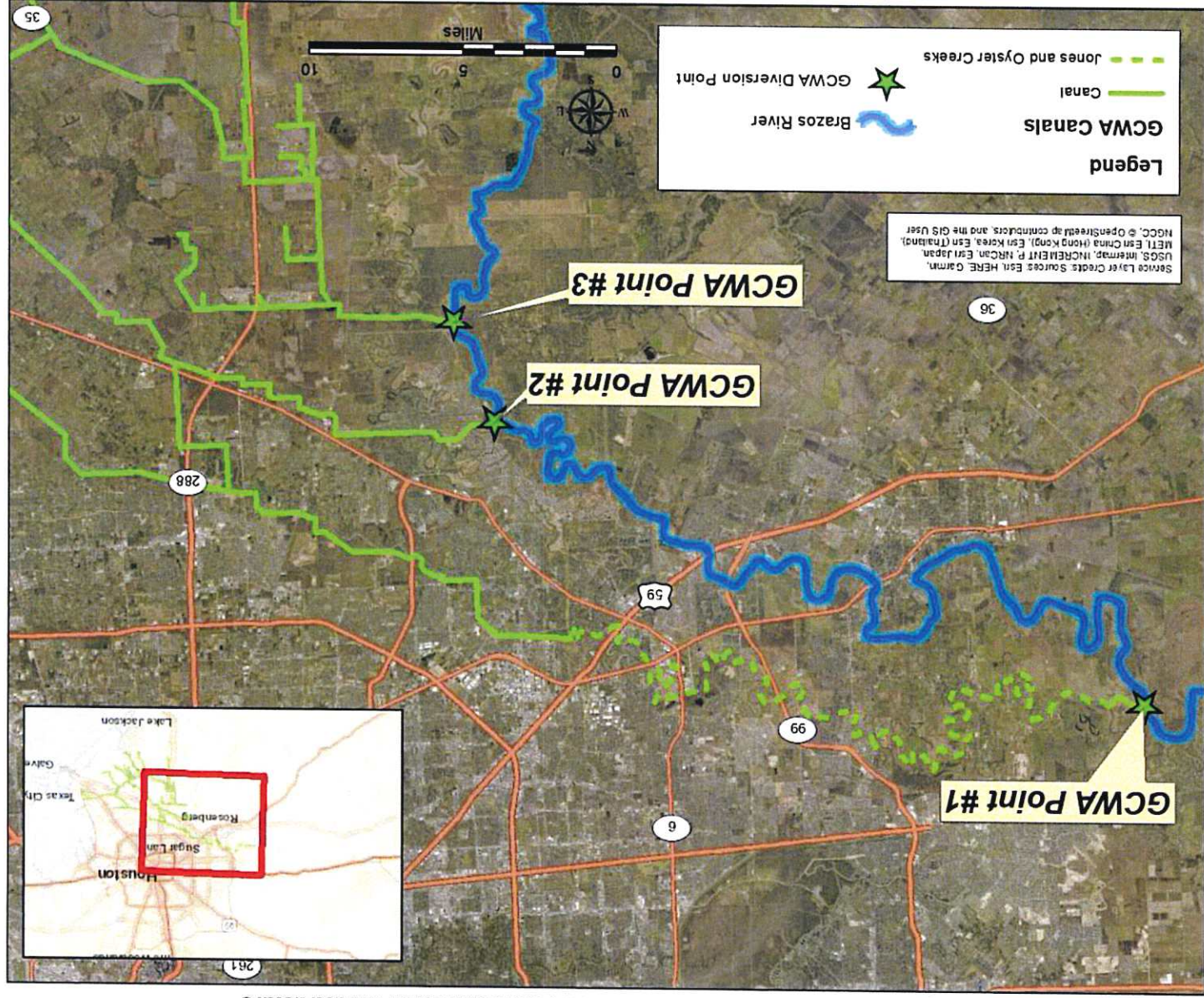


Figure 1-2: Location of Three Diversion Points and Canal Infrastructure



## 1.2 PROPOSED AMENDMENTS

GCWA seeks amendments to its Brazos River water rights to allow flexible operation of these rights by allowing diversion at GCWA's discretion of any portion of any of these three rights at any of GCWA's three diversion locations on the river for municipal, industrial, irrigation, and mining uses, subject to applicable permit conditions and any active priority calls. This report is part of three separate water right amendment applications that are summarized below.

Proposed amendments to CA 12-5168 seek to allow or expressly incorporate:

- diversion at GCWA Point #3 (Juliff pump station)
- mining as an authorized use at the priority date in the original certificate of adjudication (Jan 15, 1926)
- an exempt interbasin water transfer from the Brazos River basin to the San Jacinto-Brazos Coastal basin
- the two authorized diversion points (GCWA Points #1 and #2) and the proposed new diversion point (Point #3) to be converted from diversion points to diversion reaches
- use of the bed and banks of the portions of Jones and Oyster Creeks that are a part of GCWA's existing American Canal System
- use of a single combined daily accounting plan for all three GCWA Brazos River water rights
- diversion of any portion of the CA in any order at the rightholder's discretion, subject to availability, priority calls, and other permit conditions
- removal of legacy irrigation conditions and limitations not applicable to a wholesale water provider, including requirements related to irrigation acreage, application rate, and locations

Proposed amendments to CA 12-5171 seek to allow or expressly incorporate:

- diversion at GCWA Point #3 (Juliff pump station)
- irrigation as an authorized use at the Feb 1, 1939 priority
- municipal, industrial, and mining as authorized uses at the Dec 12, 1950 priority
- Harris County as an authorized place of use
- an exempt interbasin water transfer from the Brazos River basin to the San Jacinto-Brazos Coastal basin

- the two authorized diversion points (GCWA Points #1 and #2) and the proposed new diversion point (Point #3) to be converted from diversion points to diversion reaches
- use of the bed and banks of the portions of Jones and Oyster Creeks that are a part of GCWA's existing American Canal System
- use of a single combined daily accounting plan for all three GCWA Brazos River water rights
- diversion of any portion of the CA in any order at the rightholder's discretion, subject to availability, priority calls, and other permit conditions
- removal of legacy irrigation conditions and limitations not applicable to a wholesale water provider, including requirements related to irrigation acreage, application rate, and locations

Proposed amendments to CA 12-5322 seek to allow or expressly incorporate:

- diversion at GCWA Point #1 (Shannon pump station)
- mining as an authorized use at the three priority dates in the original certificate of adjudication (Feb 8, 1929; Mar 14, 1955; and Jul 25, 1983)
- an exempt interbasin water transfer from the Brazos River basin to the San Jacinto-Brazos Coastal basin
- the two authorized diversion points (GCWA Points #2 and #3) and the proposed new diversion point (Point #1) to be converted from diversion points to diversion reaches
- use of the bed and banks of the portions of Jones and Oyster Creeks that are a part of GCWA's existing American Canal System
- use of a single combined daily accounting plan for all three GCWA Brazos River water rights
- **diversion** of any portion of the CA in any order at the rightholder's discretion, subject to availability, priority calls, and other permit conditions
- removal of legacy irrigation conditions and limitations not applicable to a wholesale water provider, including requirements related to irrigation acreage, application rate, and locations

The worksheets included as part of each application are summarized below:

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information**

The applications request diversion location changes for three water rights and additional authorized uses to allow diversion for municipal, industrial, mining, and irrigation uses by all three rights at any priority date currently authorized under the rights. The applications do not request a new appropriation of State Water, nor do they seek to increase the maximum



diversion rate currently authorized for each right. It should be noted that Pursuant to Title 30, Texas Administrative Code (TAC) §295.101 and §297.101, a list of GCWA contracts to supply other entities, including agricultural customers, with water can be found in Attachment 3.

- **Worksheet 1.1 – Interbasin Transfers Information**

Each application requests an interbasin water transfer. The proposed transfer is from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin, an adjoining coastal basin, and is within the service area of GCWA. For these reasons, the transfer is exempt under Texas Water Code (TWC) §11.085(v).

- **Worksheet 1.2 – The Marshall Criteria**

The applications include an assessment of the Marshall Criteria because the amendments seek to add new use types and places of use (see Attachment 4).

- **Worksheet 2.0 – Impoundment/Dam Information**

This worksheet was not included because the application does not request any additional impoundments, reservoirs, or dams. Existing off-channel reservoirs associated with CA 12-5168 and CA 12-5322 are used for operational purposes and do not influence the run-of-river availability of water from the Brazos River.

- **Worksheet 3.0 – Diversion Point (or Diversion Reach) Information**

The applications request that each right be granted authorization to divert at any of GCWA's Brazos River diversion locations (addition of GCWA Point #3 to CA 12-5168 and 12-5171, with addition of GCWA Point #1 to CA 12-5322). It should be noted that diversion of CA 12-5322 at GCWA Point #2 (GCWA Briscoe pump station) was authorized by Paragraph 2 of Amendment E to CA 12-5322, granted January 7, 2011. Pursuant to Paragraph 5 of Amendment E, prior to diversion of CA 12-5322 at GCWA Point #2 the owner must apply for and be granted an amendment for approval of a daily accounting Plan (see Attachment 2). Further, the amendments request that the three existing diversion locations be changed from Diversion Points to Diversion Reaches. The Diversion Reaches range from approximately 780 feet to 2,380 feet in length, extending along GCWA property. Two copies of Worksheet 3.0 are provided for each of the three proposed diversion locations (one for the upstream limit and one for the downstream limit of each diversion reach). This results in six copies of Worksheet 3.0 for each

proposed amendment. Documentation of the right to access the property along the proposed diversion reach is included in Attachment 5.

- **Worksheet 4.0 – Discharge Information**

Although the application does not seek to withdraw return flow, it does request that GCWA's current authorization to use the bed and banks of Jones and Oyster Creeks, portions of which comprise part of GCWA's existing American Canal System (Figure 1-2 and Attachment 1), to deliver water to customers be expressly incorporated into each of CA 12-5168, 12-5171, and 12-5322. Jones and Oyster Creeks constitute approximately 42 of the 75 miles of conveyance in the American Canal System. Each application reflects the discharge of water from GCWA rights and alternate supplies into Jones and Oyster Creeks, State Watercourses, for conveyance and later withdrawal. Diversions made under CA 12-5168 and CA 12-5171 have historically been conveyed using this watercourse. Included in Attachment 6 is a document from the Texas Commission on Environmental Quality (TCEQ) confirming GCWA's authorization to use the bed and banks of Jones and Oyster Creeks.

- **Worksheet 4.1 – Discharge Point Information**

Discharge Point Information for the transfer of water from the Brazos River to the American Canal System, which includes portions of Jones and Oyster Creeks, is provided for each of the three proposed amendments.

- **Worksheet 5.0 – Environmental Information**

The Environmental Information worksheet is required for each application because of the associated requests to change a diversion location. Due to the limited extent of the proposed reaches and similarities in riparian conditions within each reach and among all three proposed reaches, a single Worksheet 5.0 is included for each application. All three reaches are within 50 river miles of each other and the longest reach is approximately 2,380 feet. Diversion reach photographs and supporting information are included in Attachment 7.

- **Worksheet 6.0 – Water Conservation/Drought Contingency Plans**

Water Conservation and Drought Contingency Plans are required for these applications because of requests adding a purpose of use and place of use. The GCWA Water Conservation Plan is included as Attachment 8. The GCWA Drought Contingency Plan is included as Attachment 9. Both attachments include adoption documentation. The proposed amendments do not seek to

increase GCWA's authorized diversion amount or the maximum diversion rate for each right, but rather to increase the operational flexibility of the GCWA system. The utilization of this water as requested in the proposed amendments, in conjunction with GCWA's Water Conservation Plan, could potentially reduce or delay the need to utilize increased supplies from other sources.

- **Worksheet 7.0 – Accounting Plan Information**

The Accounting Plan Information worksheet is required for these applications because of the associated requests for authorization to divert water from multiple points and rights at multiple diversion rates and priority dates. The GCWA Water Right Accounting Plan Report is included as Attachment 10. The Accounting Plan Workbook and supporting documentation will be submitted in electronic format along with the application forms for proposed water right amendments. Rule §297.58(b) in Title 30 of the Texas Administrative Code states that if *"a water right has appropriations with different priority dates, the oldest priority water shall be credited against the water first used unless the water right expressly provides otherwise or the water right holder requested the watermaster to count the water use against the junior portion of the right."* This application package requests the ability to count the water use against any priority portion of a CA in any order at the rightholder's discretion, subject to availability, priority calls<sup>1</sup>, and other permit conditions. The Accounting Plan supports detailed tracking and documentation to implement the requested amendments.

- **Worksheet 8.0 – Calculation of Fees**

Fees associated with each application are included on Worksheet 8.0.

- **Additionally**, the applications request that language within the original Certificates of Adjudication regarding specific acreages of land to be irrigated and other irrigation limitations be removed from the terms of the rights. These conditions are a legacy of the original nature of the rights and do not align with the current use of the rights as wholesale supplies. This change would increase the operational flexibility of GCWA's water rights. The pertinent sentences are highlighted in Attachment 11.

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<sup>1</sup> In a basin with a Watermaster, priority calls directly from downstream senior water rights holders are not likely to occur. The term priority call as used in this application is therefore also intended to refer to the advance communication of the Watermaster to GCWA that water at a specific priority date is needed downstream to meet a senior need as documented through a Declaration of Intent to Divert.



The Attachments included with this report as part of the application are:

- **Attachment 1:** GCWA Diversion Location Maps
- **Attachment 2:** Certificate of Adjudication 12-5322, As Amended
- **Attachment 3:** GCWA Contracts to Other Entities (Addendum to Worksheet 1.0)
- **Attachment 4:** Marshall Criteria (Addendum to Worksheet 1.2)
- **Attachment 5:** Diversion Point Access Documentation (Addendum to Worksheet 3.0)
- **Attachment 6:** Canal Documentation
- **Attachment 7:** Diversion Point Photographs and Supporting Information (Addendum to Worksheet 5.0)
- **Attachment 8:** GCWA Water Conservation Plan (Addendum to Worksheet 6.0)
- **Attachment 9:** GCWA Drought Contingency Plan (Addendum to Worksheet 6.0)
- **Attachment 10:** Water Right Accounting Plan Report (Addendum to Worksheet 7.0)
- **Attachment 11:** Irrigation Language Applicant Requests Be Removed
- **Attachment 12:** WAM Modeling and No Injury Analysis
- **Attachment 13:** Signatory Authority



## **2.0 WATER AVAILABILITY ANALYSIS**

Impacts of the proposed amendment of diversion locations were assessed through a comparison of pre- and post-amendment water availability model runs. The modeling environment, assumptions, approach, and results are summarized in the following report subsections. More detailed information on the modeling approach can be found in Attachment 12.

### **2.1 SUMMARY OF WAM BASE MODEL**

The water availability analysis was conducted using the February 1, 2018 version of the Texas Commission on Environmental Quality (TCEQ) Brazos River Basin and San Jacinto Brazos Coastal Basin Water Availability Model (WAM), Full Authorization Scenario. The Full Authorization Scenario, also known as Run 3, assumes full authorized use of all permanent water rights authorizations and no return flows. The TCEQ Brazos WAM contains Senate Bill 3 (SB3) environmental flow requirements and the Brazos River Authority's System Operation permit. Several features of the TCEQ WAM relevant to GCWA's Brazos River water rights are described below.

1. The TCEQ WAM reflects CA 12-5168 and CA 12-5171 diverting at Point #2 only (i.e. Control Point CON155 in the WAM). As shown in Table 1-1, both water rights are currently authorized to divert at Point #1 and Point #2.
2. The TCEQ WAM has CA 12-5322 diverting at Point #3 only (i.e. Control Point 532201 in the WAM). Amendment E to CA 12-5322 authorizes the right to divert at Point #2 as well. However, the diversions at Point #2 are junior in time priority to the interjacent water rights between Points #2 and #3 and to the existing water rights at those points as those rights existed on August 24, 2006.
3. CA 12-5322 has a special condition preventing diversions when the Brazos River at Rosharon gage (USGS 08116650) is less than 700 cfs. However, the 700 cfs limit does not apply if diversions would not be injurious to downstream appropriators. In situations in which a diversion would not be injurious to senior downstream appropriators, a minimum flow of 15 cfs from April through August and 5 cfs for the rest of the year must be met. Because the WAM inherently protects other water rights, TCEQ does not include the 700 cfs provision in the model and only the 15 cfs and 5 cfs restrictions are applied.

4. The Brazos WAM does not model the storage authorized by CA 12-5322. This storage, which is used for operational purposes, is relatively small and does not affect run-of-river availability of water for the water right.

## **2.2 SUMMARY OF WAM MODIFICATIONS AND ASSUMPTIONS**

Based on an initial review of the TCEQ WAM, FNI identified several changes which are incorporated into the FNI Base Model. The purpose of the base model is to reflect “pre-project” conditions.

1. CA 12-5168 and CA 12-5171 are modeled as diverting at Point #1 first, and then they take any remaining authorization at Point #2, if available. Within the Base Model, no streamflow diversions are made at Point #3 by these two rights.
2. Within the TCEQ WAM, CA 12-5168 is modeled with a 7,373 ac-ft reservoir associated with it. Within the Base Model, this right is modeled as a conventional run-of-river diversion without access to storage. This simplifies the analysis and does not increase annual availability from the Brazos River, which is limited by the CA and modeled streamflow.
3. CA 12-5322 is modeled as making diversions at Point #2 first, at its original priority, and then taking any remaining authorization at Point #3, if available. Within the Base Model, no streamflow diversions are made at Point #1 by CA 12-5322.

The “post-project” model makes the following changes to the base model.

1. In the post-project model, any remaining authorization not diverted by CA 12-5168 and CA 12-5171 at Points #1 and #2 is diverted at Point #3, if available, under those respective authorizations.
2. CA 12-5322 is modeled as making streamflow depletions at Point #1 first, at its original priority dates, subject to SB3 environmental flow subsistence and base criteria at the Richmond gage (USGS 08114000). Within the model, the diversion of water at Point #1 under CA 12-5322 is not subject to SB3 pulse flow requirements due to existing instream flow requirements in the right and the proximity of Point #1 to the previously authorized Point #2 for the CA, which was authorized without pulse flow requirements.

Due to the small length of the proposed reaches, diversions were modeled at discrete points. Note that this approach to the post-project model assumes all three GCWA rights divert preferentially from Point #1. This condition was selected as it would be anticipated to reveal any impacts due to the smaller

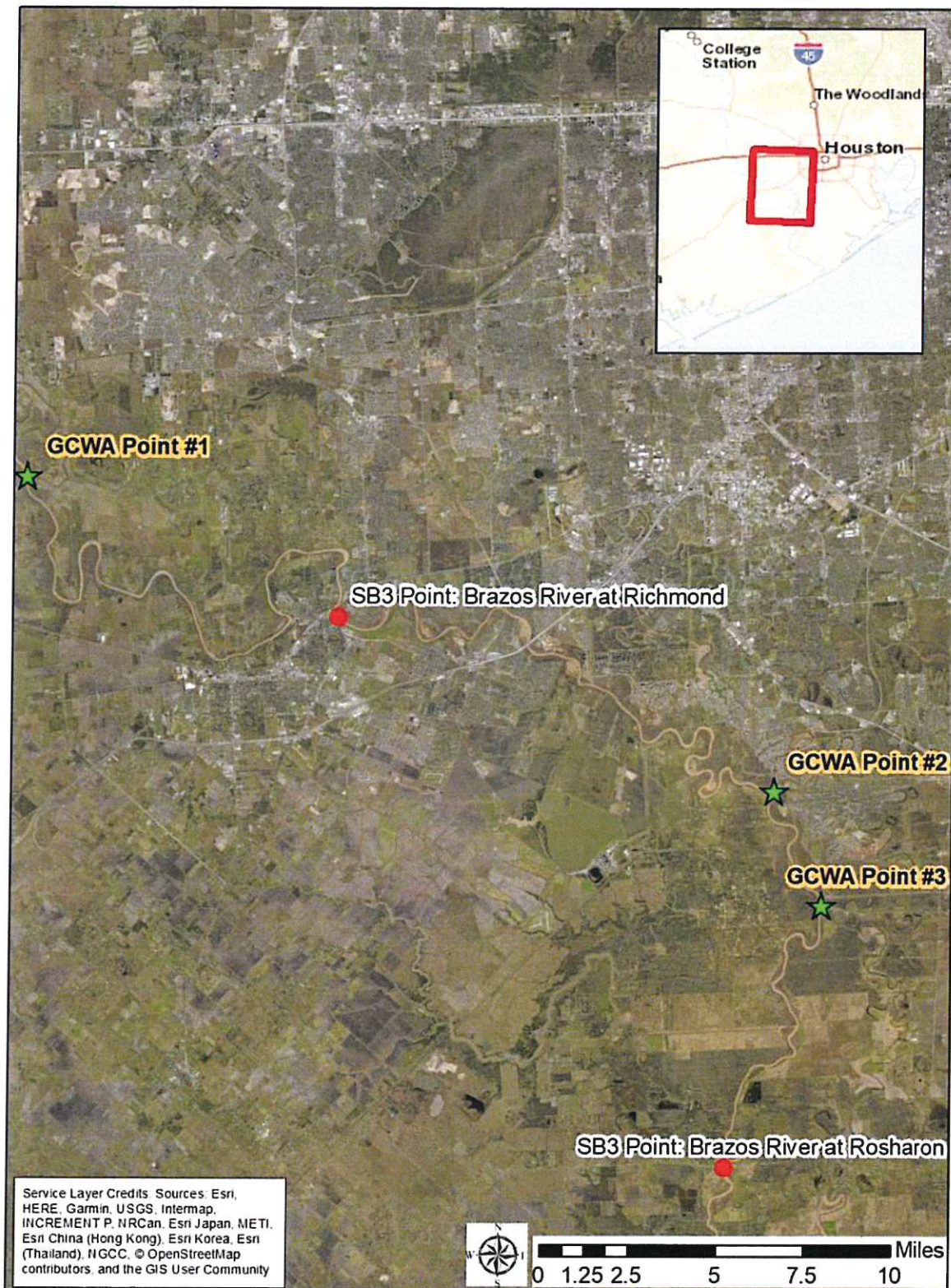
drainage area of the diversion point, the presence of other downstream water rights, and the need to reflect SB3 environmental flow restrictions for the proposed diversion of CA 12-5322 at that point. If the proposed amendments are approved, water diverted under these three rights could be taken at Point #1 and Point #2. The proposed amendments would also allow any combination of the three diversion points. Some combinations are already permitted by the existing authorizations. Any combination that has CA 12-5168 and CA 12-5171 diverting from Point #3 or CA 12-5322 diverting from Point #1 would require the amendments requested as part of this application. Note that all three rights are currently authorized to divert from Point #2, so there are no impacts relative to a pre-project condition if all three rights divert preferentially from Point #2.

### **2.3 ENVIRONMENTAL FLOWS**

There are nineteen measurement points for the adopted environmental flow standards in the Brazos River Basin and San Jacinto Brazos Coastal Basin WAM. The Brazos River at Richmond gage (USGS 08114000) is an environmental flow measurement point located downstream of Point #1 and upstream of Point #2. The Brazos River at Rosharon gage is an environmental flow measurement point located downstream of Point #3 (Figure 2-1).



Figure 2-1: SB3 Measurement Points Near GCWA Diversion Points





Within the post-project model, subsistence and base flow criteria at the Richmond gage were applied to diversions made under CA 12-5322 at the proposed diversion location (Point #1). CA 12-5322 has three priority dates associated with its diversions (Table 1-1). Within the post-project WAM model, the environmental flow requirements shown in Table 2-1 were turned on immediately prior to diversions being made at Point #1 under CA 12-5322 at each of its priority dates and turned off immediately after such that the environmental flow requirements are not applied to other authorizations in the basin. Table 2-1 shows the base flow and subsistence environmental flow criteria for the Brazos River near Richmond gage.

**Table 2-1: SB3 Base and Subsistence Flow Standards for Brazos River near Richmond**

Season	Subsistence	Hydrologic Condition	Base
Winter	550 cfs	Dry	990 cfs
		Average	1,650 cfs
		Wet	3,310 cfs
Spring	550 cfs	Dry	1,190 cfs
		Average	2,140 cfs
		Wet	3,980 cfs
Summer	550 cfs	Dry	930 cfs
		Average	1,330 cfs
		Wet	2,190 cfs

## 2.4 RESULTS

The modeled minimum annual diversions and the reliabilities of each of the three GCWA Brazos River rights pre- and post-project are shown in Table 2-2. The total reliable supply of the rights is slightly less under post-project conditions due to the modeled change in diversion location and the application of base and subsistence flow criteria, although the minimum amount diverted under CA 12-5322 is slightly more.

**Table 2-2: Reliable Supply of GCWA Water Rights**

	CA 12-5168	CA 12-5171	CA 12-5322	Total
Permitted Annual Diversion	99,932	125,000	155,000	379,932
<b>Pre-Project</b>				
Minimum Annual Diversion	88,302	59,490	70,847	218,640
Reliability	99.60%	95.23%	90.84%	94.59%
<b>Post-Project</b>				
Minimum Annual Diversion	88,302	59,059	70,939	218,300
Reliability	99.60%	95.12%	90.81%	94.54%

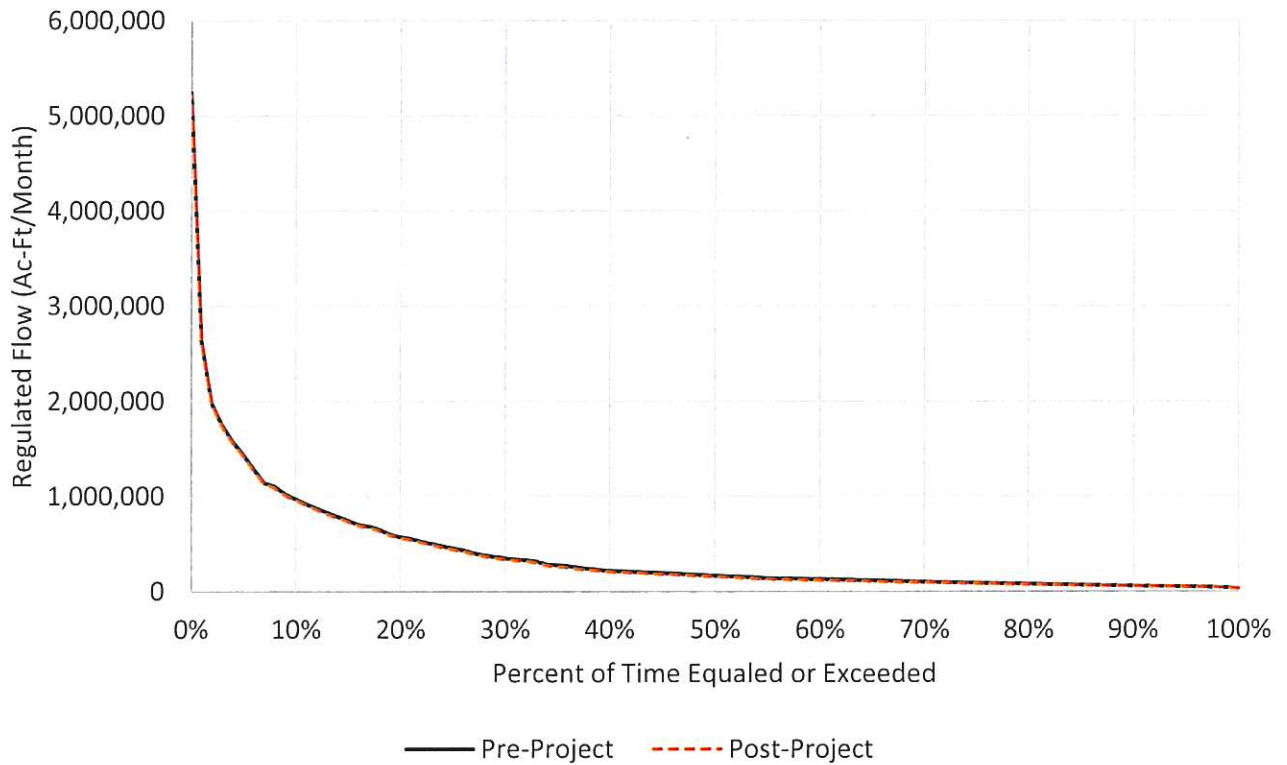
### **3.0 AFFECTED ENVIRONMENT**

Potential impacts of the proposed amendment of diversion locations on the environment were assessed through a comparison of pre- and post-amendment water availability model runs as described in Section 2.0 of this report. This analysis was focused on assessing potential impacts of moving the preferred diversion point for CA 12-5322 from Points #2 and #3 to Point #1. Diversion of CA 12-5168 and 12-5171 at Point #3 was not considered to be a concern from an environmental standpoint as doing so would involve the associated diversion volumes traveling farther downstream within the river channel.

Table 3-1 shows the pre- and post-project frequency of modeled regulated flows at the Richmond gage, which is between Points #1 and #2, for specific frequencies as well as the percent of difference from the pre-project condition. Figure 3-1 is based on the same data. Both the graph and the table illustrate the exceedance frequencies of monthly flow volume, which is the percent of months for which the monthly total flow past the gage would be at or above the flow shown. For example, for the post-project model, monthly flows would be at or above 84,302 ac-ft/month in 75 percent of months. Table 3-2 shows the frequency with which the subsistence and base flow criteria at the Richmond gage is equaled or exceeded for the pre-project and post-project modeling scenarios. It should be noted that the modeled application of base and subsistence criteria at a monthly timestep within the WAM allows diversions from other water rights not subject to the criteria to impact streamflow during the calculation process for each month, which for some timesteps results in a reclassification from base to subsistence conditions. Table 3-3 shows the pre- and post-project frequency of modeled regulated flows at the Rosharon gage, which is downstream of all three GCWA diversion points.

Based on these results, it is not anticipated that the proposed new diversion location for CA 12-5322 will impact the downstream aquatic environment since those flows are protected by the SB3 subsistence and base flow criteria. The change in river levels is unlikely to impact the use of the river for recreation. It is not anticipated that diversion from the new location will impact the water quality of the river downstream.

**Figure 3-1: Frequency of Regulated Flows at the Richmond Gage**



**Table 3-1: Exceedance Frequencies for Modeled Regulated Flows at the Richmond Gage**  
(Acre-Feet per Month)

Scenario	Exceedance Frequency				
	95%	90%	75%	50%	1%
Pre-Project	50,033	59,469	91,013	167,311	2,637,793
Post-Project	47,683	56,582	84,203	156,244	2,615,003
Difference	-2,350	-2,888	-6,810	-11,068	-22,790
% Difference	-4.7%	-4.9%	-7.5%	-6.6%	-0.9%

**Table 3-2: Attainment Frequency of Flow Criteria at the Richmond Gage**  
(% of months equaled or exceeded)

Criteria	Pre-Project	Post-Project
Subsistence	99.9%	99.9%
Base	75.3%	71.3%

**Table 3-3: Exceedance Frequencies for Modeled Regulated Flows at the Rosharon Gage**  
(Acre-Feet per Month)

Scenario	Exceedance Frequency				
	95%	90%	75%	50%	1%
Pre-Project	8,032	20,631	47,054	129,428	2,713,741
Post-Project	7,977	20,328	48,481	129,797	2,705,212
Difference	-55	-303	1,426	369	-8,529
% Difference	-0.7%	-1.5%	3.0%	0.3%	-0.3%

The application is unlikely to result in adverse impacts to groundwater resources. GCWA is authorized under CA 12-5168, 12-5171, and 12-5322 to utilize 379,932 acre-feet per year for multiple purposes and does not seek to increase the authorized amount. The proposed amendment relates to diversion and use of surface water. The utilization of this water as requested in the proposed amendments could potentially reduce or delay the need to utilize increased supplies from other sources, including groundwater.



## 4.0 IMPACTS OF PROPOSED WATER RIGHTS

### 4.1 NO INJURY ANALYSIS

Potential impacts of the proposed water right amendments on existing water rights were evaluated using the FNI Base Model to represent pre-project conditions, and models representing post-project conditions with the amendments. The existing water rights in the WAM that were impacted by an increase in mean shortage greater than 10 acre-feet per year and a decrease in volume reliability percentage greater than one percentage point are shown in Table 4-1. The rights listed in Table 4-1 are junior to the GCWA rights. Impacts to rights not shown in Table 4-1 are de minimis. Moving the primary diversion for CA 12-5322 from Point #2 to Point #1 has no impact on the modeled availability of interjacent water right CA 12-5320. CA 12-5320 is owned by NRG Texas Power LLC and is the only water right between Point #1 and Point #2 on the main stem of the Brazos River as modeled in the TCEQ WAM. Details of the no injury analysis, and accompanying WAM modeling, can be found in Attachment 12. The diversions made under CA 12-5168, 12-5171, and 12-5322 at each diversion point will be tracked in the Accounting Plan to document compliance with the water right. A summary document detailing the function of the Accounting Plan is included as Attachment 10.

**Table 4-1: List of Impacted Water Rights**

(Those with an Increase in Mean Shortage >10 Ac-Ft/Yr and a Decrease in % Volume Reliability >1)

Water Right (Name in WAM)	Change in Mean Shortage (ac-ft/yr)	Change in % Volume Reliability	Priority	Location (Control Point in WAM)	Notes
P4016_3	10.12	-1.03	3/13/1984	401611	a
Lumped Dep 2925	947.89	-2.60	9/1/1999	292531	b
C3775_4	10.73	-2.14	9/29/2000	377511	a
WTYT2_DS_IND	132.87	-1.13	3/2/2012	433001	b

*a. Diversion associated with irrigation right*

*b. Diversion associated with the Brazos River Authority System Operation permit*

### 4.2 IMPACT ON INSTREAM USES

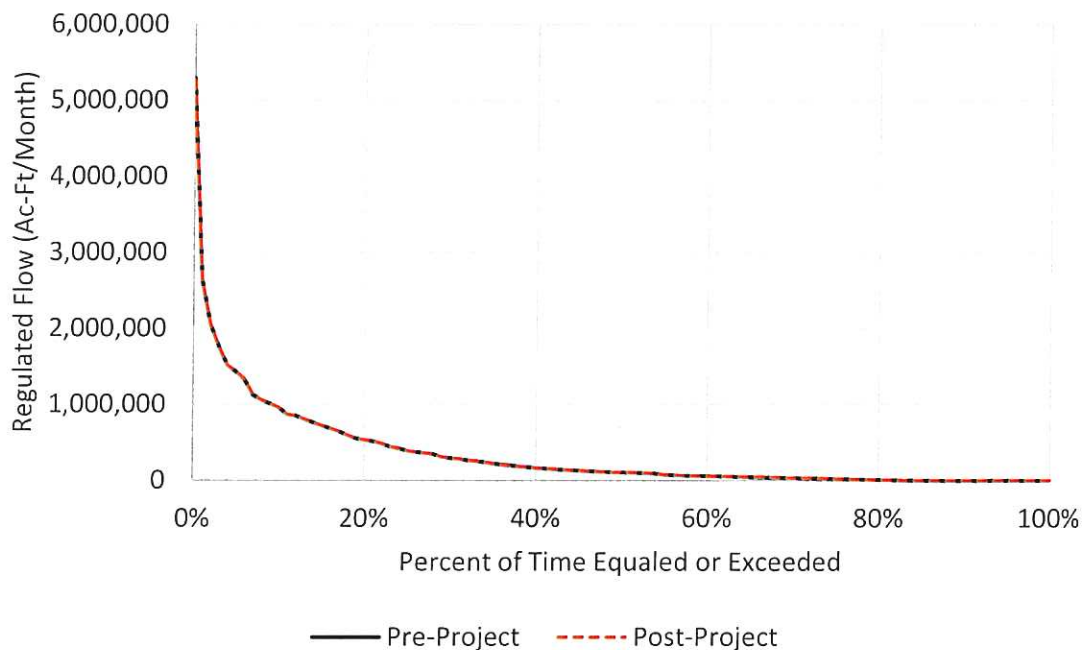
This application does not seek to increase the amount of water currently authorized to be diverted or the maximum rate at which each water right is diverted. The proposed amendments seek to add diversion locations and types of use, as well as other amended provisions which do not directly impact diversions.

The proposed amendments were modeled as subject to SB3 subsistence and base instream flow criteria, which are designed to protect instream uses.

### 4.3 IMPACTS ON BAYS AND ESTUARIES

Model analyses indicate minimal impact on bays and estuaries since the applications do not seek to increase the total amount authorized to be diverted or the maximum diversion rate for each right. Inflow standards have not been adopted for the Bay and Estuary System associated with the Brazos River. Figure 4-1 shows the pre- and post-project frequency of regulated flows at the Gulf of Mexico, as well as the percent of difference from the pre-project condition. Table 4-2 is based on the same data and shows values for specific frequencies. The difference in frequency between median regulated flows at the Gulf of Mexico is zero. Based on the model results, the lowest flows (exceedance frequencies between 90% and 100%) are typically less than 100 ac-ft/month for either pre- or post-project conditions and overall flow will be slightly higher under the post-project conditions.

**Figure 4-1: Frequency of Regulated Flows at the Gulf of Mexico**



**Table 4-2: Exceedance Frequencies for Regulated Flows at the Gulf of Mexico**  
(Acre-Feet per Month)

Scenario	Exceedance Frequency				
	95%	90%	75%	50%	1%
Pre-Project	1	5	20,244	107,943	2,638,519
Post-Project	1	5	21,579	107,943	2,630,142
Difference	0	0	1,335	0	-8,377
% Difference	-3.7%	-5.3%	6.6%	0.0%	-0.3%

#### **4.4 IMPACTS ON WETLANDS**

It is not anticipated that diversions from the new locations will impact wetlands because the proposed amendments do not seek to increase the overall diversion amounts or maximum rates of diversion for each right.

#### **4.5 WATER CONSERVATION**

GCWA's water conservation and drought contingency plans facilitate the responsible use of water and help the organization avoid waste and promote water conservation. The Water Conservation Plan is included as Attachment 8 and the Drought Contingency Plan is Attachment 9. The proposed amendments do not seek to increase GCWA's authorized diversion amount or the maximum diversion rate for each right, but rather to increase the operational flexibility of the GCWA system. The utilization of this water as requested in the proposed amendments, in conjunction with GCWA's Water Conservation Plan, could potentially reduce or delay the need to utilize increased supplies from other sources.

#### **4.6 INTERBASIN TRANSFERS**

Each application requests an exempt interbasin water transfer (Worksheet 1.1). The proposed transfer is from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin, an adjoining coastal basin, and is within the service area of GCWA. For these reasons, the transfer is exempt under TWC §11.085(v). It should be noted that the existing water right authorizations already allow use of GCWA's Brazos River water rights in both the Brazos River Basin and in the adjacent San Jacinto-Brazos Coastal Basin; GCWA's service area is primarily within the coastal basin.



#### **4.7 CONSISTENCY WITH REGIONAL WATER PLANS**

The proposed amendments are consistent with the 2016 Region H Water Plan and the 2017 State Water Plan. The run-of-river supplies authorized by CA 12-5168, CA 12-5171, and CA 12-5322 were accounted for as part of existing supplies in the Regional Plan. GCWA is a major provider of water for Galveston County as well as a provider for entities in Brazoria, Harris, and Fort Bend Counties. According to the RWP, demands in the four-county area served by GCWA are expected to increase from 2.1 million acre-feet per year in 2020 to 2.8 million acre-feet per year by 2070. The proposed amendments will increase the operational flexibility of the GCWA system, enabling GCWA to more reliably meet the needs of the customers that depend on it for water supply as well as future customers by matching supplies to the locations of those demands. The proposed amendments do not increase the permitted supply volume, but instead add flexibility to the GCWA system, which will be critical to meeting these demands in the future.

#### **4.8 OTHER POTENTIAL IMPACTS**

There are anticipated to be minimal, if any, impacts to water quality, the environment, or agricultural resources because the proposed amendments do not increase the authorized annual diversion volume or the maximum diversion rate for each right. A list of GCWA contracts to supply other entities, including agricultural customers, with water can be found in Attachment 3.



## **Attachment 1**

### GCWA Diversion Location Maps



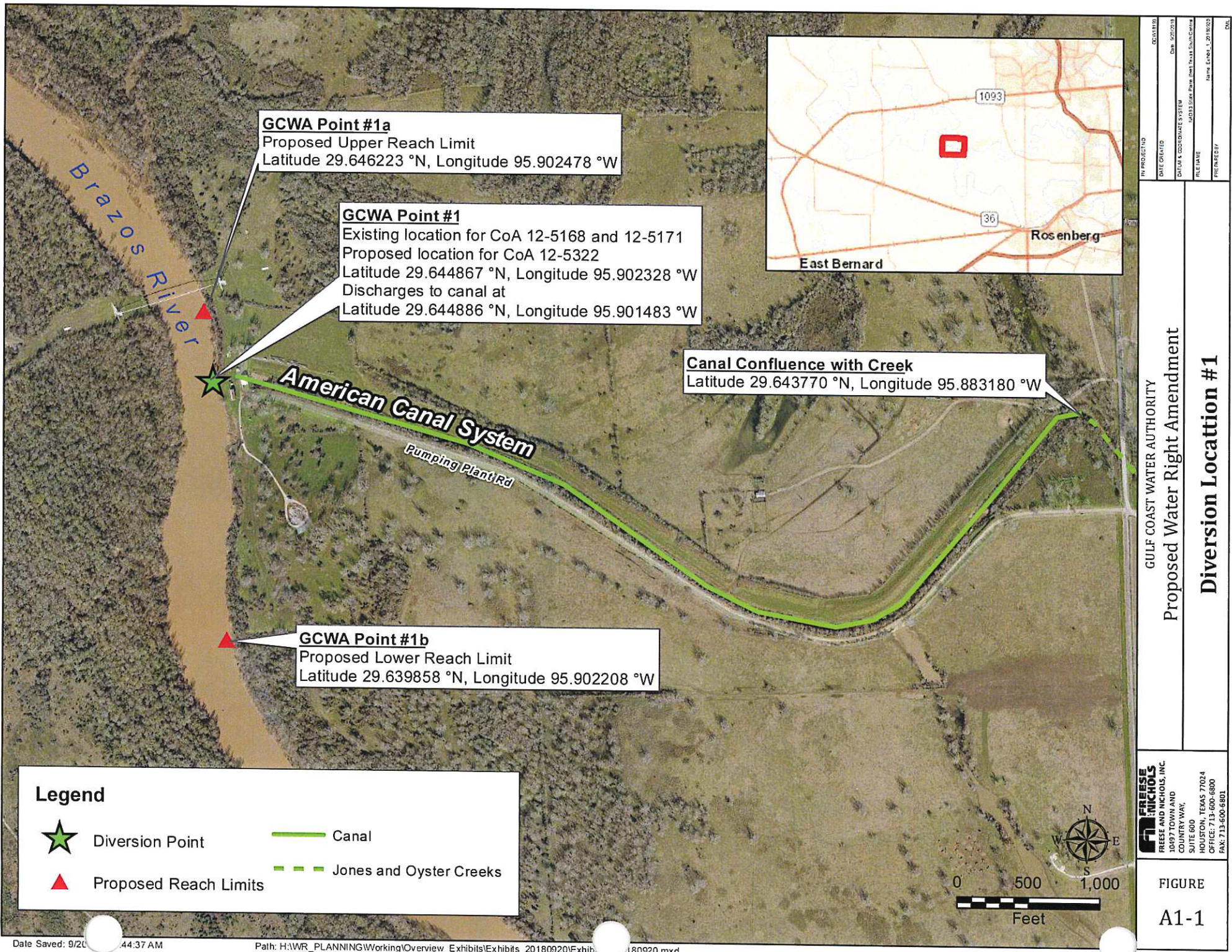


GULF COAST WATER AUTHORITY  
Proposed Water Right Amendment  
Diversion Points Overview

**FREESE AND NICHOLS, INC.**  
10497 TOWN AND COUNTRY WAY, SUITE 600  
HOUSTON, TEXAS 77024  
OFFICE 713-600-6800  
FAX 713-600-6801

FIGURE  
A1-OV



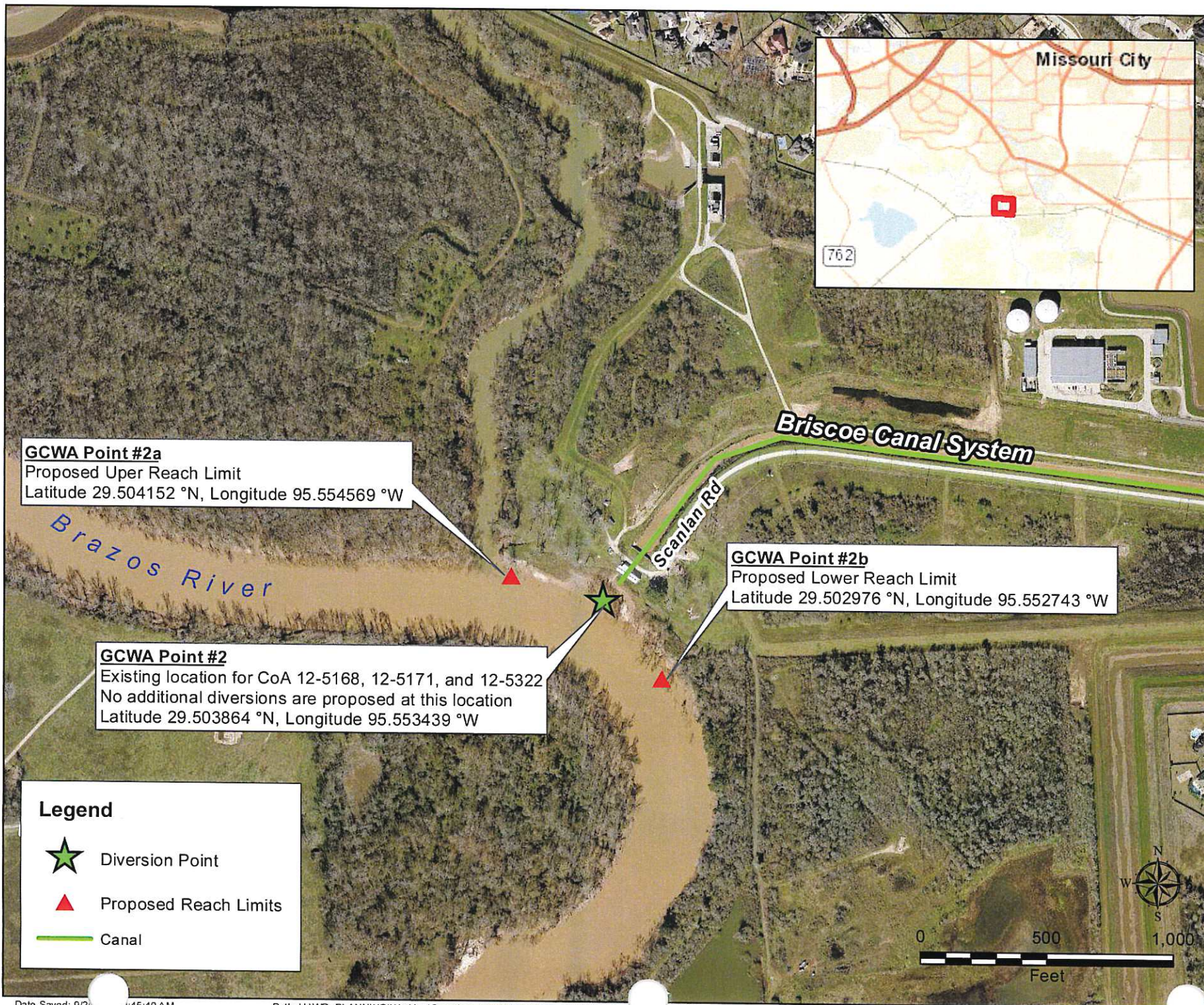


GULF COAST WATER AUTHORITY  
Proposed Water Right Amendment  
**Diversion Location #1**

**FREESE AND NICHOLS, INC.**  
15477 TOWN AND COUNTRY WAY, SUITE 600  
HOUSTON, TEXAS 77024  
OFFICE: 713-600-6800  
FAX: 713-600-8801

FIGURE  
**A1-1**





GULF COAST WATER AUTHORITY

Proposed Water Right Amendment

Diversion Point #2

**PRESE & NICHOLS, INC.**  
10497 TOWN AND COUNTRY WAY, SUITE 600  
HOUSTON, TEXAS 77024  
OFFICE: 713-600-6800  
FAX: 713-600-6801

FIGURE

A1-2







## **Attachment 2**

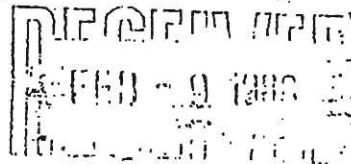
Certificate of Adjudication12-5322, As Amended



7



CERTIFICATE OF ADJUDICATION



CERTIFICATE OF ADJUDICATION: 12-5322

OWNER: Chocolate Bayou Water  
Company  
P. O. Box 1305  
Alvin, Texas 77511

COUNTIES: Fort Bend and Brazoria

PRIORITY DATES: February 8, 1929;  
March 14, 1955  
and July 25, 1983

WATERCOURSE: Brazos River

BASIN: Brazos River

WHEREAS, by final decree of the 21st Judicial District Court of Bastrop County, in Cause No. 18,762, In Re: The Adjudication of Water Rights in the Brazos IV Segment of the Brazos River Basin and the San Jacinto-Brazos Coastal Basin dated June 1, 1987 a right was recognized under Permit 1145E authorizing the Chocolate Bayou Water Company to appropriate waters of the State of Texas as set forth below:

NOW, THEREFORE, this certificate of adjudication to appropriate waters of the State of Texas in the Brazos River Basin is issued to the Chocolate Bayou Water Company, subject to the following terms and conditions:

1. IMPOUNDMENT.

- A. Owner is authorized to maintain and impound water in an existing 200 acre-foot capacity off-channel reservoir (Juliff Reservoir). The reservoir is located in the William Pettus Grant, Abstract 68, Fort Bend County, Texas.
- B. Owner is authorized to maintain and impound water in an existing 144 acre-foot capacity off-channel reservoir (Bonney Reservoir). The reservoir is located in the Warren D. C. Hall Grant, Abstract 69, Brazoria County, Texas.
- C. Owner is authorized to maintain and impound water in an existing 520 acre-foot capacity off-channel reservoir (Liverpool Reservoir). The reservoir is located in the Day Land & Cattle Company Survey, Abstract 601, Brazoria County, Texas.

2. USE

Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.



## Certificate of Adjudication 12-5322

## 3. DIVERSION

## A. Location:

At a point on the Brazos River in the William Pettus Grant, Abstract 68, Fort Bend County, Texas.

B. Maximum rate: 900.00 cfs (405,000 gpm).

## 4. PRIORITY

A. The time priority of owner's right is February 8, 1929 for the diversion and use of the first 40,000 acre-feet of water at a maximum diversion rate of 400 cfs (180,000 gpm).

B. The time priority of owner's right is March 14, 1955 for the diversion and use of the next 40,000 acre-feet of water at a maximum diversion rate of 668 cfs (300,600 gpm).

C. The time priority of owner's right is July 25, 1983 for the diversion and use of the remaining 75,000 acre-feet of water at the maximum authorized diversion rate of 900 cfs (405,000 gpm).

## 5. SPECIAL CONDITIONS

A. The 115,000 acre-feet of water diverted under priority dates of March 14, 1955 and July 25, 1983, may be diverted only under certain flow restrictions measured at the USGS gaging station No. 08116650 on the Brazos River at Rosharon, Texas, which is to be reinstated by owner and provided with remote interrogation facilities prior to diversion.

(1) Owner is authorized to divert water only when the flow of the Brazos River at the USGS gaging station at Rosharon, Texas, equals or exceeds 700 cfs; or when the gaging station is below 700 cfs but is at least 15 cfs during April through August and 5 cfs during all other months of the year and the diversions of water hereunder are not injurious to senior downstream appropriators; or when the water being diverted are waters lawfully purchased by the owner from the Brazos River Authority under existing legal contract between the two parties, or other waters lawfully purchased under any other legal contract.

(2) The aforesaid streamflow restrictions are exclusive of any releases dedicated by the Brazos River Authority from its conservation storage for subsequent use downstream. The Executive Director has established a procedure for advising owner when water, exclusive of Brazos River Authority's dedicated releases, is available for

## Certificate of Adjudication 12-5322

diversion hereunder. Owner shall contact the Commission prior to diversion of water hereunder each irrigation season to be advised of this procedure.

- (3) Owner shall establish and maintain sufficient daily diversion and streamflow records to document which authorizations and appropriate restrictions are being exercised.
  - (4) In order to prevent distortions in assessing any streamflow restriction requirements in analyses of future applications to appropriate water from the Brazos River, the Commission may for the purposes of these hydrology analyses consider that a 406 cfs streamflow restriction is sufficient to provide substantial protection to existing water rights. In making such analyses, the Commission should utilize the 406 cfs streamflow restriction, rather than the 700 cfs restriction.
- B. Owner is authorized to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation purposes in said coastal basin.
- C. Owner is authorized the use of the aforesaid reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season.

The location of pertinent features related to this certificate are shown on Pages 31 and 34 of the Brazos IV River Segment Certificates of Adjudication Maps, copies of which are located in the office of the Texas Water Commission, Austin, Texas.

This certificate of adjudication is issued subject to all terms, conditions and provisions in the final decree of the 21st Judicial District Court of Bastrop County, Texas, in Cause No. 18,762, In Re: The Adjudication of Water Rights in the Brazos IV Segment of the Brazos River Basin and the San Jacinto-Brazos Coastal Basin dated June 1, 1987 and supersedes all rights of the owner asserted in that cause.

This certificate of adjudication is issued subject to senior and superior water rights in the Brazos River Basin.

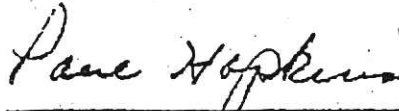
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## Certificate of Adjudication 12-5322

This certificate of adjudication is issued subject to the Rules of the Texas Water Commission and its continuing right of supervision of State water resources consistent with the public policy of the State as set forth in the Texas Water Code.

TEXAS WATER COMMISSION

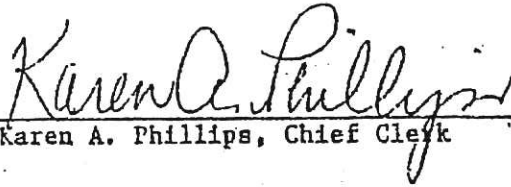


Paul Hopkins, Chairman

DATE ISSUED:

JAN 14 1998

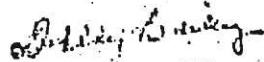
ATTEST:




Karen A. Phillips, Chief Clerk

FILED FOR RECORD

JAN 27 8 41 AM '98

  
COUNTY CLERK  
BRAZORIA COUNTY, TEXASTHE STATE OF TEXAS  
COUNTY OF BRAZORIA

I, DOLLY BAILEY, Clerk of the County Court in and for Brazoria County, Texas, do hereby certify that this instrument was FILED FOR RECORD and RECORDED in the Volume and page of the OFFICIAL RECORD at the time and date as stamped hereon by me.

  
County Clerk of Brazoria Co., TX



AS PER ORIGINAL

8844163

THE STATE OF TEXAS 2062 66  
COUNTY OF TRAVIS  
I hereby certify that this is a true and  
correct copy of a Texas Water Commission  
document, the original of which is filed in  
the permanent records of the Commission.  
Given under my hand and seal of office  
on AUG 18 1988

*Karen A. Phillips*

Karen A. Phillips, Chief Clerk  
Texas Water Commission

AMENDMENT TO  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322A

TYPE: AMENDMENT

Name: Chocolate Bayou  
Water Company

Address: P.O. Box 550  
Alvin, Texas 77512-0550

Filed: July 14, 1988

Granted: August 9, 1988

Purpose: Industrial

Counties: Fort Bend and Brazoria

Watercourse: Brazos River

Watershed: Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with impoundment capacities of 200, 144 and 520 acre-feet in Fort Bend and Brazoria Counties and to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River at a maximum diversion rate of 900 cfs (405,000 gpm) to irrigate a maximum of 41,200 acres of land within the company's service area in Fort Bend and Brazoria Counties, Texas; and

WHEREAS, Special Condition C. of the certificate states that "Owner is authorized the use of the aforesaid reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season"; and

WHEREAS, Chocolate Bayou Water Company has requested an amendment to Certificate No. 12-5322 to also allow the use of the reservoirs concurrently for industrial purposes (to raise fish on a commercial basis); and

WHEREAS, Chocolate Bayou Water Company has indicated that during periods other than the irrigation season the reservoirs will impound water from sources other than authorized under the certificate; and

NOW, THEREFORE, this amendment to Certificate No. 12-5322 is issued to Chocolate Bayou Water Company as follows:

*Give to Jane*



AS PER ORIGINAL

## 1. USE

In addition to the authorization included in Paragraph 2., USE, of Certificate No. 12-5322, certificate owner is authorized to use water stored in the off-channel reservoirs for in-place industrial (fish farming) purposes.

## 2. SPECIAL CONDITION

In lieu of Special Condition C, contained in Certificate No. 12-5322, the following is substituted:

C. Certificate owner is authorized the use of the aforesaid reservoirs as buffer reservoirs to facilitate pumping and efficiency as part of owner's irrigation system and to concurrently use the impounded water for in-place industrial purposes.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate No. 12-5322, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Water Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS WATER COMMISSION

DATE ISSUED: August 16, 1988

  
B. J. Wynne, III, Chairman

ATTEST:

  
Karen A. Phillips, Chief Clerk

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AMENDMENT TO  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322B

TYPE: AMENDMENT

*BT* Name: Chocolate Bayou Water Company Address: P. O. Box 550  
Alvin, Texas 77512-0550

Filed: September 11, 1990 Granted: October 10, 1990

Purposes: Industrial and Irrigation Counties: Fort Bend and Brazoria Counties

Watercourse: Brazos River Watershed: Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with impoundment capacities of 200, 144 and 520 acre-feet in Fort Bend and Brazoria Counties; and

WHEREAS, owner is also authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the company's service area in Fort Bend and Brazoria Counties, Texas at a maximum diversion rate of 900 cfs (405,000 gpm); and

WHEREAS, Special Condition B. of Certificate No. 12-5322, authorizes the transfer of water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation purposes; and

WHEREAS, Special Condition C. of Certificate No. 12-5322, authorized the use of the reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season; and

WHEREAS, Certificate No. 12-5322A was issued on August 16, 1988 wherein Special Condition C., was changed and authorization was obtained to concurrently use the water stored in the aforesaid off-channel reservoirs for in-place industrial (fish farming) purposes; and

WHEREAS, Chocolate Bayou Water Company has requested an amendment to Certificate No. 12-5322, as amended, to convert water from irrigation purposes to industrial purposes; and to change Special Condition B. and C. for clarification purposes relating to the use change; and

WHEREAS, the Texas Water Commission finds that jurisdiction over the application is established; and

WHEREAS, no person protested the granting of this application; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Water Commission in issuing this amendment.

NOW, THEREFORE, this amendment to Certificate No. 12-5322, as amended, is issued to Chocolate Bayou Water Company, subject to the following provisions:

1. In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended:

Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the owner's service area.

2. In lieu of Special Condition C., contained in Certificate No. 12-5322A, owner is authorized the use of the aforesaid reservoirs to impound water for irrigation and industrial purposes.
3. In lieu of Special Condition B., contained in Certificate No. 12-5322, as amended, owner is authorized to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation and industrial purposes in said coastal basin.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.



Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

Certificate owner shall use those practices, techniques, and technologies that will reduce the loss or waste of water, improve the efficiency and use of water so that only so much water as can be beneficially used will be diverted. Furthermore, diversion and use will occur only when reasonably necessary because of prevailing climate conditions and subject to the terms and conditions of this certificate.

All other matters requested in the application which are not specifically granted by this amendment are denied.

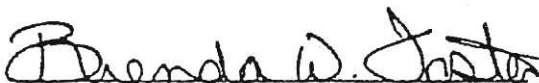
This amendment is issued subject to the Rules of the Texas Water Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS WATER COMMISSION

  
B. J. Wynne, III, Chairman

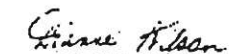
DATE ISSUED: OCT 29 1990

ATTEST:

  
Brenda W. Foster, Chief Clerk

FILED

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ELAINE WILSON  
COUNTY CLERK  
FORT BEND COUNTY, TEXAS

STATE OF TEXAS COUNTY OF FORT BEND  
I, hereby certify that this instrument was filed on the  
date and time stamped hereon by me and was duly recorded in  
the volume and page of the Official Records of Fort Bend  
County, Texas as stamped by me.

NOV 15 1990



  
Elaine Wilson  
County Clerk Fort Bend Co., Tex.



## TEXAS NATURAL RESOURCE CONSERVATION COMMISSION



THE STATE OF TEXAS  
COUNTY OF TRAVIS  
I hereby certify that this is a true and correct copy of a Texas Natural  
Resource Conservation Commission document, which is filed in the  
permanent records of the Commission.  
Given under my hand and the seal of office on

*Lydonna Castaneda* SEP 13 2001  
Lydonna Castaneda, Chief Clerk  
Texas Natural Resource  
Conservation Commission

AMENDMENT TO  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO.	12-5322C	Type:	§11.122 & 11.085
Owner:	Chocolate Bayou Water Company	Address	P. O. Box 550 Alvin, Texas 77512-0550
Filed:	August 7, 2001	Granted:	SEP 12, 2001
Purpose:	Municipal, Industrial Irrigation	County:	Fort Bend, Brazoria And Harris
Watercourse:	Brazos River	Watershed:	Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company (CBWC) on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with respective impoundment capacities of 200, 144, and 520 acre-feet of water in Fort Bend and Brazoria Counties; and

WHEREAS, Certificate of Adjudication No. 12-5322 contains special stream flow conditions under which the authorized water may be diverted; and

WHEREAS, Certificate of Adjudication No. 12-5322, as amended, authorizes the owner to divert and use not to exceed 145,000 acre-feet of water per annum to irrigate 41,200 acres of land and not to exceed 10,000 acre-feet of water per annum for industrial purposes from a point on the Brazos River in the William Pettus Grant, Abstract No. 68, Fort Bend County, for use within the owner's service area in Fort Bend and Brazoria Counties; and

WHEREAS, the time priority is February 8, 1929 for the diversion and use of the first 40,000 acre-feet of water at a maximum diversion rate of 400 cubic feet per second (180,000 gallons per minute), March 14, 1955 for the diversion and use of the next 40,000 acre-feet of water at a maximum diversion rate of 668 cfs (300,600 gpm), and July 25, 1983 for the diversion and use of the remaining 75,000 acre-feet of water at a maximum diversion rate of 900 cfs (405,000 gpm); and

WHEREAS, Certificate of Adjudication No. 12-5322, as amended, authorizes the owner to use the aforesaid reservoirs to impound water for irrigation and industrial purposes; and

WHEREAS, Special Condition B to Certificate of Adjudication No. 12-5322, as amended, authorizes the owner to transfer water diverted from the Brazos River Basin to the San Jacinto-Brazos River Coastal Basin for irrigation and industrial purposes in said basin; and

WHEREAS, Chocolate Bayou Water Company seeks to amend Certificate of Adjudication No. 12-5322 to authorize, pursuant to Texas Water Code (TWC) §44.023(e), multi-purpose use (irrigation, industrial, and/or municipal) for the 155,000 acre-feet of water per annum authorized for diversion, to add Harris County to the counties within the service area of CBWC, and to authorize the place of use to include that part of CBWC's service that lies within the San Jacinto Basin; and

WHEREAS, the Texas Natural Resource Conservation Commission finds that jurisdiction over the application is established; and

WHEREAS, the diversion and use of water requested by this application lies within the Coastal Zone Management Plan area, and the application has been reviewed for and found to comply with the Coastal Zone Management Plan; and

WHEREAS no one protested the granting of the proposed amendment to Certificate of Adjudication No. 12-5322; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Natural Resource Conservation Commission in issuing this amendment;.

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, as amended, designated as Certificate of Adjudication 12-5322C, is issued to the Chocolate Bayou Water Company subject to the following terms and conditions:

1. USE

In lieu of the purpose of use authorizations of Certificate Adjudication No. 12-5322, as amended, owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum for municipal, irrigation and industrial purposes for use within the owner's service area in Fort Bend, Brazoria and Harris Counties.

2. CONSERVATION

Certificate owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses

### 3. SPECIAL CONDITIONS

- D. In lieu of the provisions of Special Condition 5B contained in Certificate of Adjudication No. 12-5322, as amended, owner may transfer water authorized herein from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin and the San Jacinto River Basin for use within the owner's service area in Fort Bend, Brazoria, and Harris Counties.
- E. Owner shall submit, or require wholesaler contract holders to prepare and adopt, a wholesale water conservation and drought contingency plan within 180 days prior to the diversion of the water for the new purposes and places of use authorized under this amendment. The plan shall meet the minimum requirements as defined in Title 30 TAC Chapter §288.5 and §288.22 and shall set forth strategies for ongoing conservation.
- F. Permittee is required to record for reporting purpose the actual monthly amounts used for the individual purposes (municipal, irrigation and industrial) under the multi-purpose authorization.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate of Adjudication No. 12-5322, as amended.

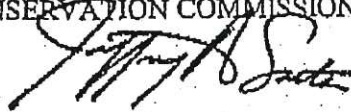
This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Natural Resource Conservation Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS NATURAL RESOURCE  
CONSERVATION COMMISSION



For the Commission

Date Issued: SEP 12 2001



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## AMENDMENT TO A CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322E

TYPE: §§11.122 & 11.085

Owner:	Gulf Coast Water Authority	Address:	3630 Highway 1765 Texas City, Texas 77591
Filed:	August 24, 2006	Granted:	January 7, 2011
Purpose:	Municipal, Industrial, and Agricultural (Irrigation)	Counties:	Fort Bend, Brazoria, Harris, and Galveston
Watercourse:	Brazos River	Watershed:	Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin

WHEREAS, Gulf Coast Water Authority (Owner or Applicant), is authorized to divert and use not to exceed 155,000 acre-feet of water per year a maximum combined diversion rate of 900 cfs (405,000 gpm) from the Brazos River, Brazos River Basin, at a point in the William Pettus Grant, Abstract No. 68 in Fort Bend County, for municipal, industrial, and agricultural (irrigation) purposes within the Owner's service area in Fort Bend, Brazoria, and Harris Counties in the Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin pursuant to an exempt interbasin transfer; and

WHEREAS, Owner is also authorized to maintain three off-channel reservoirs known as Juliff, Bonney, and Liverpool Reservoirs in Fort Bend and Brazoria Counties and impound therein a combined maximum of 864 acre-feet of water for industrial purposes and subsequent agricultural (irrigation) purposes; and

WHEREAS, Owner's time priority is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm); and

WHEREAS, the maximum authorized combined diversion rate is 900 cfs (405,000 gpm); and

WHEREAS, diversion of the water authorized with time priorities of March 14, 1955 and July 25, 1983 is subject to a special condition restricting diversion to specific minimum streamflows exclusive of contract water released by the Brazos River Authority for downstream use; and



WHEREAS, Applicant seeks to amend Certificate of Adjudication No. 12-5322 to add a diversion point approximately 3.9 miles upstream of the currently authorized point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7 in Fort Bend County, located at Latitude 29.504°N and Longitude 95.551°W. This diversion point is also authorized by Certificates of Adjudication No. 12-5168 and No. 12-5171, owned by the Gulf Coast Water Authority, and Certificates of Adjudication No. 12-5166 and No. 12-5167, owned by the Brazos River Authority; and

WHEREAS, Applicant also seeks an exempt interbasin transfer pursuant to Texas Water Code §11.085(v)(3) to authorize Galveston County as a place of use within its authorized service area in the San Jacinto-Brazos Coastal Basin; and

WHEREAS, no increase in the diversion amount or the diversion rate is being requested; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, the Executive Director recommends that special conditions be included in the amendment; and

WHEREAS, eight requests for a contested case hearing were received. Two requests for a contested case hearing were granted by the commission, and those two were subsequently withdrawn; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality Commission in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322E, is issued to the Gulf Coast Water Authority, subject to the following terms and conditions:

1. USE

In addition to the currently authorized place of use, Owner is also authorized an exempt interbasin transfer to use the 155,000 acre-feet of water per year in Galveston County, within its authorized service area, in the San Jacinto-Brazos Coastal Basin.

2. DIVERSION

In addition to the authorization to divert water at a point on the Brazos River in the William Pettus Grant, Abstract No. 68 in Fort Bend County (Diversion Point 1), Owner is also authorized to divert water from a point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7, Fort Bend County, located at Latitude 29.504°N and Longitude 95.551°W (Diversion Point 2). This diversion point is also authorized by Certificates of Adjudication No. 12-5168 and No. 12-5171, owned by the Gulf Coast Water Authority, and Certificates of Adjudication No. 12-5166 and No. 12-5167, owned by the Brazos River Authority.

3. PRIORITY

- A. Time priority for diversion and use from Diversion Point 1 is February 8, 1929, for diversion and use of the first 40,000 acre-feet of water at 400 cfs (180,000 gpm); March 14, 1955, for the next 40,000 acre-feet of water at 668 cfs (300,600 gpm); and July 25, 1983, for the remaining 75,000 acre-feet of water at 900 cfs (405,000 gpm).
- B. Time priority for diversion and use of water from Diversion Point 2 is the same as Diversion Point 1, except that it is junior in time priority to the interjacent water rights between that point and Diversion Point 1 and to the existing water rights at those points, as those rights existed on August 24, 2006, the filing date of this amendment.

4. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water is required to implement water conservation measures.

5. SPECIAL CONDITION

In addition to the special conditions already present in Certificate of Adjudication No. 12-5322, as amended, which remain in effect:

Prior to the diversion of water at the upstream diversion point authorized in this amendment, Owner shall apply for and be granted an amendment to this Certificate to add provisions providing that the Owner have an approved daily accounting plan and requiring maintenance of that daily plan. The plan must include, at a minimum, a method that accounts by priority date, diversion rate, restrictions and authorization number for all water diverted from the Brazos River at the upstream point pursuant to all authorizations to divert at that point. The plan must be provided in electronic format.

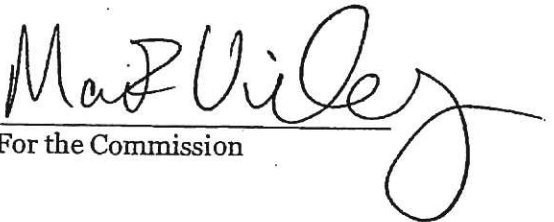
This amendment is issued subject to all terms, conditions, and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

  
For the Commission

ISSUED: **January 7, 2011**

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



AMENDMENT TO A  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322F

TYPE: §§11.122 & 11.085

Owner:	Gulf Coast Water Authority	Address:	3630 Highway 1765 Texas City, Texas 77591
Filed:	March 10, 2010	Granted:	<b>MAR 30 2010</b>
Purpose:	Municipal, Industrial, and Agricultural	Counties:	Brazoria and Fort Bend Counties
Watercourse:	Brazos River	Watershed:	Brazos River Basin and San Jacinto-Brazos Coastal Basin

WHEREAS, Gulf Coast Water Authority (Owner) is authorized to divert and use not to exceed 155,000 acre-feet of water per year at a maximum combined diversion rate of 900 cfs (405,000 gpm) from the Brazos River, Brazos River Basin, at a point in the William Pettus Grant, Abstract No. 68 in Fort Bend County, for municipal, industrial, and agricultural (irrigation) purposes within the Owner's service area in Fort Bend, Brazoria, and Harris Counties in the Brazos River Basin, San Jacinto River Basin, and San Jacinto-Brazos Coastal Basin pursuant to an exempt interbasin transfer; and

WHEREAS, Owner is also authorized to maintain three off-channel reservoirs known as Juliff, Bonney, and Liverpool Reservoirs in Fort Bend and Brazoria Counties and impound therein a combined maximum of 864 acre-feet of water for industrial purposes and subsequent agricultural (irrigation) purposes; and

WHEREAS, multiple time priorities apply; and

WHEREAS, Special Condition 5.B. of Certificate of Adjudication No. 12-5322, as amended, authorizes Owner to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for agricultural (irrigation) and industrial purposes in that coastal basin; and

WHEREAS, Owner seeks to amend Certificate of Adjudication No. 12-5322 to authorize exempt interbasin transfer of Brazos River Basin contract water from the Brazos River Basin to the adjoining San Jacinto-Brazos Coastal Basin for agricultural (irrigation) purposes in that coastal basin; and

WHEREAS, no increase in the diversion amount or the diversion rate is being requested; and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, no requests for a contested case hearing were received for this application; and



WHEREAS, Application No. 12-5322E by Gulf Coast Water Authority to amend Certificate of Adjudication No. 12-5322 is pending; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality Commission in issuing this amendment;

NOW, THEREFORE, this amendment to Certificate of Adjudication No. 12-5322, designated Certificate of Adjudication No. 12-5322F, is issued to the Gulf Coast Water Authority, subject to the following terms and conditions:

1. CONSERVATION

Owner shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water will be required to implement water conservation measures.

2. SPECIAL CONDITIONS

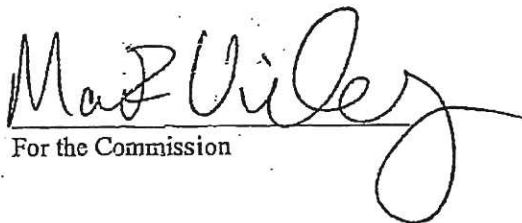
In addition to the existing authorizations in Special Condition 5.B. of Certificate of Adjudication No. 12-5322, as amended, Owner is authorized an exempt interbasin transfer of Brazos River Basin contract water from the Brazos River Basin to the adjoining San Jacinto-Brazos Coastal Basin for agricultural purposes in that coastal basin.

This amendment is issued subject to all terms, conditions, and provisions contained in Certificate of Adjudication No. 12-5322, as amended, except as specifically amended herein.

Owner agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

All other matters requested in the application which are not specifically granted by this amendment are denied.

This amendment is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of State water resources exercised by the Commission.

  
For the Commission

ISSUED: **MAR 30 2010**

## **Attachment 3**

Addendum to Worksheet 1.0:  
GCWA Contracts to Other Entities

Entities which, as of August 2018, have contracts to receive water supply from the Gulf Coast Water Authority (GCWA) are listed alphabetically below by major customer type category. GCWA serves a range of customers ranging from small municipal utility districts to large municipalities and industrial facilities over a broad geographic area.

**Municipal and Industrial Customers**

- Ascend Performance Materials
- Ashland Specialty Chemicals
- Bacliff Municipal Utility District
- Bayview Municipal Utility District
- Blanchard Refining Company
- City of Galveston
- City of Hitchcock
- City of La Marque
- City of League City
- City of Missouri City
- City of Pearland
- City of Sugar Land
- City of Texas City
- DOW/Union Carbide Corp.
- Eastman Chemical Company
- Fort Bend Water Control and Improvement District #2
- Galveston County Fresh Water Supply District #6
- Galveston County Municipal Utility District #12
- Galveston County Water Control and Improvement District #1
- Galveston County Water Control and Improvement District #8
- Galveston County Water Control and Improvement District #12
- INEOS Olefins and Polymers
- Pecan Grove Municipal Utility District
- San Leon Municipal Utility District
- Underground Storage
- Valero Texas City Refinery

**Agricultural Customers (Interruptible Contracts)**

- Bulanek, DJ
- Bulanek, Donnie
- Bulanek, Joe
- Bulanek, Nelson
- Casey & Jeri Smith Farms
- Castillo, Julio

- Christian, Corey
- Duke, Ronald
- Dumesnil, Ronny
- Eversole, Jacob
- Frank, Chris
- Frank, Matt
- Garrett, Jacko
- Gulf Coast Farms
- Hairston, Matthew
- Hairston, Scott
- Halewyn, Dean
- Harvey, Garrett
- Hlavinka, Kenneth
- Journeay, Thomas
- Kreft, Clayton
- LeCompte, David
- Max Wollam & Sons
- McCormick, Jimmy
- Miller, Jerry
- Mock, Wade
- Mowery, Rodney
- Olsovsky, Jeff
- Peltier, Vince
- Svahn, Fred
- Tomlinson, Mark
- Tomlinson, Seth
- WRW Farms

**Other Interruptible Contract Customers**

- Diamond K
- First Colony Commons
- First Colony Community Services
- Mag Creek Country Club
- Mainland Concrete
- Riverbend Country Club
- Silvercreek Community Association
- Sugar Creek Country Club
- Texas City Golf Course



## **Attachment 4**

Addendum to Worksheet 1.2:  
Marshall Criteria

**Responses to Marshall Criteria for Certificate of Adjudication 12-5168**

- A. Administrative Requirements and Fees:** *Confirm whether application meets the administrative requirements for an amendment to a water use permit pursuant to TWC Chapter 11 and Title 30 Texas Administrative Code (TAC) Chapters 281, 295, and 297. An amendment application should include, but is not limited to, a sworn application, maps, completed conservation plan, fees, etc.*

The application provides relevant information to address the administrative requirements of 30 TAC §295, Subchapter A and the requirements of Texas Water Code Chapter 11. In accordance with 30 TAC §295.131 and other TCEQ rules relating to fees, GCWA is submitting payment of \$225.00 with this application. With the filing of this application, the GCWA requests a determination of any additional fees that may be required. Upon receipt of such determination, GCWA will forward such fees to the TCEQ.

- B. Beneficial Use:** *Discuss how proposed amendment is a beneficial use of the water as defined in TWC § 11.002 and listed in TWC § 11.023. Identify the specific proposed use of the water (e.g., road construction, hydrostatic testing, etc.) for which the amendment is requested.*

Texas Water Code §11.134(b)(3)(A) requires that proposed appropriations of water be intended for a beneficial use. The proposed amendment does not seek to appropriate more water. CA 12-5168 has already been permitted for municipal, industrial and irrigation uses. This application seeks to add mining as a use. The beneficial use of water is defined in Texas Water Code §11.002(4) and 30 TAC §297.1(8) as the use of water "which is economically necessary for a purpose authorized by [Chapter 11 of the Texas Water Code]." A mining purpose of use is identified in Texas Water Code §11.023 as a purpose for which water may be diverted and beneficially used and is defined in 30 TAC §297.1(31) as "the use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field repressuring."

- C. Public Welfare:** *Explain how proposed amendment is not detrimental to the public welfare. Consider any public welfare matters that might be relevant to a decision on the application. Examples could include concerns related to the well-being of humans and the environment.*

GCWA is a major provider of water for Galveston County as well as a provider for entities in Brazoria, Harris, and Fort Bend Counties. GCWA serves 13 community water utilities with potable water, but in addition GCWA provides the raw water supply to several municipal users. There are more than 250,000 Texans that rely on GCWA water for their daily lives. GCWA's industrial customers are involved in many important industries, including major economic drivers in Texas. Several major refining and petrochemical entities are solely served by GCWA. GCWA provides water for up to 20,000 acres of rice farming in Brazoria and Galveston counties each year. The proposed amendment will increase the operational flexibility of the GCWA system, enabling GCWA to more easily meet the needs of the customers that depend on it for water supply. GCWA is not seeking an increased amount to be diverted or increased diversion rate, making environmental impacts or impacts to environmental flow standard compliance unlikely to occur. GCWA's water conservation and drought contingency plans further facilitate GCWA's use of water, and help the organization avoid waste and promote water conservation. Therefore, the proposed amendment is not detrimental to the public welfare.

**D. Groundwater Effects:** *Discuss effects of proposed amendment on groundwater or groundwater recharge.*

The application will not result in adverse impacts to groundwater resources. GCWA is fully authorized under CA 12-5168 to utilize 99,932 acre-feet per annum for multiple purposes and does not seek to increase the authorized amount. The proposed amendment relates to diversion and use of surface water. The utilization of this water as requested in the proposed amendment could potentially reduce or delay the need to utilize increased supplies from other sources, including groundwater.

**E. State Water Plan:** *Describe how proposed amendment addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement*

This application is consistent with the 2017 State Water Plan and 2016 Region H Regional Water Plan. The run-of-river supplies authorized by CA 12-5168 were accounted for as part of existing supplies in the Regional Water Plan. The proposed amendment does not increase the permitted supply volume, but instead adds operational flexibility to the GCWA system, supporting GCWA's ability to match supply with demand throughout its four-county service area.

**F. Waste Avoidance:** *Provide evidence that reasonable diligence will be used to avoid waste and achieve water conservation as defined in TWC § 11.002. Examples of evidence could include, but are not limited to, a water conservation plan or, if required, a drought contingency plan, meeting the requirements of 30 TAC Chapter 288.*

GCWA's Water Conservation Plan (WCP) and Drought Contingency Plan (DCP) are submitted with this application as addenda to Worksheet 6.0. The objectives of the WCP are to reduce water consumption, reduce the loss and waste of water, improve efficiency in the use of water, document the level of recycling and reuse of water, extend the availability of water during drought, and delay the need to develop more water supplies. These plans include all of the elements required by TCEQ and some elements of the plans go beyond TCEQ requirements. GCWA's compliance with the Plans for multiple uses will promote water conservation and the avoidance of waste in water use.

**G. Impacts on Water Rights or On-stream Environment:** *Explain how proposed amendment will not impact other water right holders or the on-stream environment beyond and irrespective of the fact that the water right can be used to its full authorized amount.*

The proposed amendment seeks to add a diversion location and a type of use. This application does not seek to increase the amount of water currently authorized to be diverted or the maximum rate at which water is diverted for the right. The potential impacts on existing water rights of the proposed water right amendment were evaluated using the Brazos River WAM Run 3. In WAM Run 3, all other water rights in the basin attempt to divert their full permitted amounts, with access to their full permitted storage, and no return flows. This analysis found no impact to senior water rights, and minor impacts to four junior water rights. Details of the no injury analysis can be found in a separate attachment to this application. Flow at the Richmond

gage is occasionally reduced relative to the pre-project condition, but the on-stream environment is protected by environmental flows and there is no net increase in the modeled amount taken from the river by GCWA's rights.



**Responses to Marshall Criteria for Certificate of Adjudication 12-5171**

- A. Administrative Requirements and Fees:** *Confirm whether application meets the administrative requirements for an amendment to a water use permit pursuant to TWC Chapter 11 and Title 30 Texas Administrative Code (TAC) Chapters 281, 295, and 297. An amendment application should include, but is not limited to, a sworn application, maps, completed conservation plan, fees, etc.*

The application provides relevant information to address the administrative requirements of 30 TAC §295, Subchapter A and the requirements of Texas Water Code Chapter 11. In accordance with 30 TAC §295.131 and other TCEQ rules relating to fees, GCWA is submitting payment of \$225.00 with this application. With the filing of this application, the GCWA requests a determination of any additional fees that may be required. Upon receipt of such determination, GCWA will forward such fees to the TCEQ.

- B. Beneficial Use:** *Discuss how proposed amendment is a beneficial use of the water as defined in TWC § 11.002 and listed in TWC § 11.023. Identify the specific proposed use of the water (e.g., road construction, hydrostatic testing, etc.) for which the amendment is requested.*

Texas Water Code §11.134(b)(3)(A) requires that proposed appropriations of water be intended for a beneficial use. The proposed amendment does not seek to appropriate more water. CA 12-5171 has already been permitted for irrigation, municipal, industrial and mining uses. This application seeks to add Harris County as a place of use and to add irrigation use to the 1939 priority water right and municipal, industrial, and mining uses to the 1950 priority. The beneficial use of water is defined in Texas Water Code §11.002(4) and 30 TAC §297.1(8) as the use of water “which is economically necessary for a purpose authorized by [Chapter 11 of the Texas Water Code].” The permitted uses are already considered to be beneficial, with the proposed amendment seeking to allow greater flexibility in the location of this beneficial use.

- C. Public Welfare:** *Explain how proposed amendment is not detrimental to the public welfare. Consider any public welfare matters that might be relevant to a decision on the application. Examples could include concerns related to the well-being of humans and the environment.*

GCWA is a major provider of water for Galveston County as well as a provider for entities in Brazoria, Harris, and Fort Bend Counties. GCWA serves 13 community water utilities with potable water, but in addition GCWA provides the raw water supply to several municipal users. There are more than 250,000 Texans that rely on GCWA water for their daily lives. GCWA’s industrial customers are involved in many important industries, including major economic drivers in Texas. Several major refining and petrochemical entities are solely served by GCWA. GCWA provides water for up to 20,000 acres of rice farming in Brazoria and Galveston counties each year. The proposed amendment will increase the operational flexibility of the GCWA system, enabling GCWA to more easily meet the needs of the customers that depend on it for water supply. GCWA is not seeking an increased amount to be diverted or increased diversion rate, making environmental impacts or impacts to environmental flow standard compliance unlikely to occur. GCWA’s water conservation and drought contingency plans further facilitate GCWA’s use of water, and help the organization avoid waste and promote water conservation. Therefore, the proposed amendment is not detrimental to the public welfare.

**D. Groundwater Effects:** *Discuss effects of proposed amendment on groundwater or groundwater recharge.*

The application will not result in adverse impacts to groundwater resources. GCWA is fully authorized under CA 12-5171 to utilize 125,000 acre-feet per annum for multiple purposes and does not seek to increase the authorized amount. The proposed amendment relates to diversion and use of surface water. The utilization of this water as requested in the proposed amendment could potentially reduce or delay the need to utilize increased supplies from other sources, including groundwater.

**E. State Water Plan:** *Describe how proposed amendment addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement*

This application is consistent with the 2017 State Water Plan and 2016 Region H Regional Water Plan. The run-of-river supplies authorized by CA 12-5171 were accounted for as part of existing supplies in the Regional Water Plan. The proposed amendment does not increase the permitted supply volume, but instead adds operational flexibility to the GCWA system, supporting GCWA's ability to match supply with demand throughout its four-county service area.

**F. Waste Avoidance:** *Provide evidence that reasonable diligence will be used to avoid waste and achieve water conservation as defined in TWC § 11.002. Examples of evidence could include, but are not limited to, a water conservation plan or, if required, a drought contingency plan, meeting the requirements of 30 TAC Chapter 288.*

GCWA's Water Conservation Plan (WCP) and Drought Contingency Plan (DCP) are submitted with this application as addenda to Worksheet 6.0. The objectives of the WCP are to reduce water consumption, reduce the loss and waste of water, improve efficiency in the use of water, document the level of recycling and reuse of water, extend the availability of water during drought, and delay the need to develop more water supplies. These plans include all of the elements required by TCEQ and some elements of the plans go beyond TCEQ requirements. GCWA's compliance with the Plans for multiple uses will promote water conservation and the avoidance of waste in water use.

**G. Impacts on Water Rights or On-stream Environment:** *Explain how proposed amendment will not impact other water right holders or the on-stream environment beyond and irrespective of the fact that the water right can be used to its full authorized amount.*

The proposed amendment seeks to add a diversion location and a type of use. This application does not seek to increase the amount of water currently authorized to be diverted or the maximum rate at which water is diverted for the right. The potential impacts on existing water rights of the proposed water right amendment were evaluated using the Brazos River WAM Run 3. In WAM Run 3, all other water rights in the basin attempt to divert their full permitted amounts, with access to their full permitted storage, and no return flows. This analysis found no impact to senior water rights, and minor impacts to four junior water rights. Details of the no injury analysis can be found in a separate attachment to this application. Flow at the Richmond

gage is occasionally reduced relative to the pre-project condition, but the on-stream environment is protected by environmental flows and there is no net increase in the modeled amount taken from the river by GCWA's rights.

**Responses to Marshall Criteria for Certificate of Adjudication 12-5322**

- A. Administrative Requirements and Fees:** *Confirm whether application meets the administrative requirements for an amendment to a water use permit pursuant to TWC Chapter 11 and Title 30 Texas Administrative Code (TAC) Chapters 281, 295, and 297. An amendment application should include, but is not limited to, a sworn application, maps, completed conservation plan, fees, etc.*

The application provides relevant information to address the administrative requirements of 30 TAC §295, Subchapter A and the requirements of Texas Water Code Chapter 11. In accordance with 30 TAC §295.131 and other TCEQ rules relating to fees, GCWA is submitting payment of \$225.00 with this application. With the filing of this application, the GCWA requests a determination of any additional fees that may be required. Upon receipt of such determination, GCWA will forward such fees to the TCEQ.

- B. Beneficial Use:** *Discuss how proposed amendment is a beneficial use of the water as defined in TWC § 11.002 and listed in TWC § 11.023. Identify the specific proposed use of the water (e.g., road construction, hydrostatic testing, etc.) for which the amendment is requested.*

Texas Water Code §11.134(b)(3)(A) requires that proposed appropriations of water be intended for a beneficial use. The proposed amendment does not seek to appropriate more water. CA 12-5322 has already been permitted for municipal, industrial and irrigation uses. This application seeks to add mining as a use. The beneficial use of water is defined in Texas Water Code §11.002(4) and 30 TAC §297.1(8) as the use of water “which is economically necessary for a purpose authorized by [Chapter 11 of the Texas Water Code].” A mining purpose of use is identified in Texas Water Code §11.023 as a purpose for which water may be diverted and beneficially used and is defined in 30 TAC §297.1(31) as “the use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field repressuring.”

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**D. Groundwater Effects:** *Discuss effects of proposed amendment on groundwater or groundwater recharge.*

The application will not result in adverse impacts to groundwater resources. GCWA is fully authorized under CA 12-5322 to utilize 155,000 acre-feet per annum for multiple purposes and does not seek to increase the authorized amount. The proposed amendment relates to diversion and use of surface water. The utilization of this water as requested in the proposed amendment could potentially reduce or delay the need to utilize increased supplies from other sources, including groundwater.

**E. State Water Plan:** *Describe how proposed amendment addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement*

This application is consistent with the 2017 State Water Plan and 2016 Region H Regional Water Plan. The run-of-river supplies authorized by CA 12-5322 were accounted for as part of existing supplies in the Regional Water Plan. The proposed amendment does not increase the permitted supply volume, but instead adds operational flexibility to the GCWA system, supporting GCWA's ability to match supply with demand throughout its four-county service area.

**F. Waste Avoidance:** *Provide evidence that reasonable diligence will be used to avoid waste and achieve water conservation as defined in TWC § 11.002. Examples of evidence could include, but are not limited to, a water conservation plan or, if required, a drought contingency plan, meeting the requirements of 30 TAC Chapter 288.*

GCWA's Water Conservation Plan (WCP) and Drought Contingency Plan (DCP) are submitted with this application as addenda to Worksheet 6.0. The objectives of the WCP are to reduce water consumption, reduce the loss and waste of water, improve efficiency in the use of water, document the level of recycling and reuse of water, extend the availability of water during drought, and delay the need to develop more water supplies. These plans include all of the elements required by TCEQ and some elements of the plans go beyond TCEQ requirements. GCWA's compliance with the Plans for multiple uses will promote water conservation and the avoidance of waste in water use.

**G. Impacts on Water Rights or On-stream Environment:** *Explain how proposed amendment will not impact other water right holders or the on-stream environment beyond and irrespective of the fact that the water right can be used to its full authorized amount.*

The proposed amendment seeks to add a diversion location and a type of use. This application does not seek to increase the amount of water currently authorized to be diverted or the maximum rate at which water is diverted for the right. The potential impacts on existing water rights of the proposed water right amendment were evaluated using the Brazos River WAM Run 3. In WAM Run 3, all other water rights in the basin attempt to divert their full permitted amounts, with access to their full permitted storage, and no return flows. This analysis found no impact to senior water rights, and minor impacts to four junior water rights. Details of the no injury analysis can be found in a separate attachment to this application. Flow at the Richmond

gage is occasionally reduced relative to the pre-project condition, but the on-stream environment is protected by environmental flows and there is no net increase in the modeled amount taken from the river by GCWA's rights.

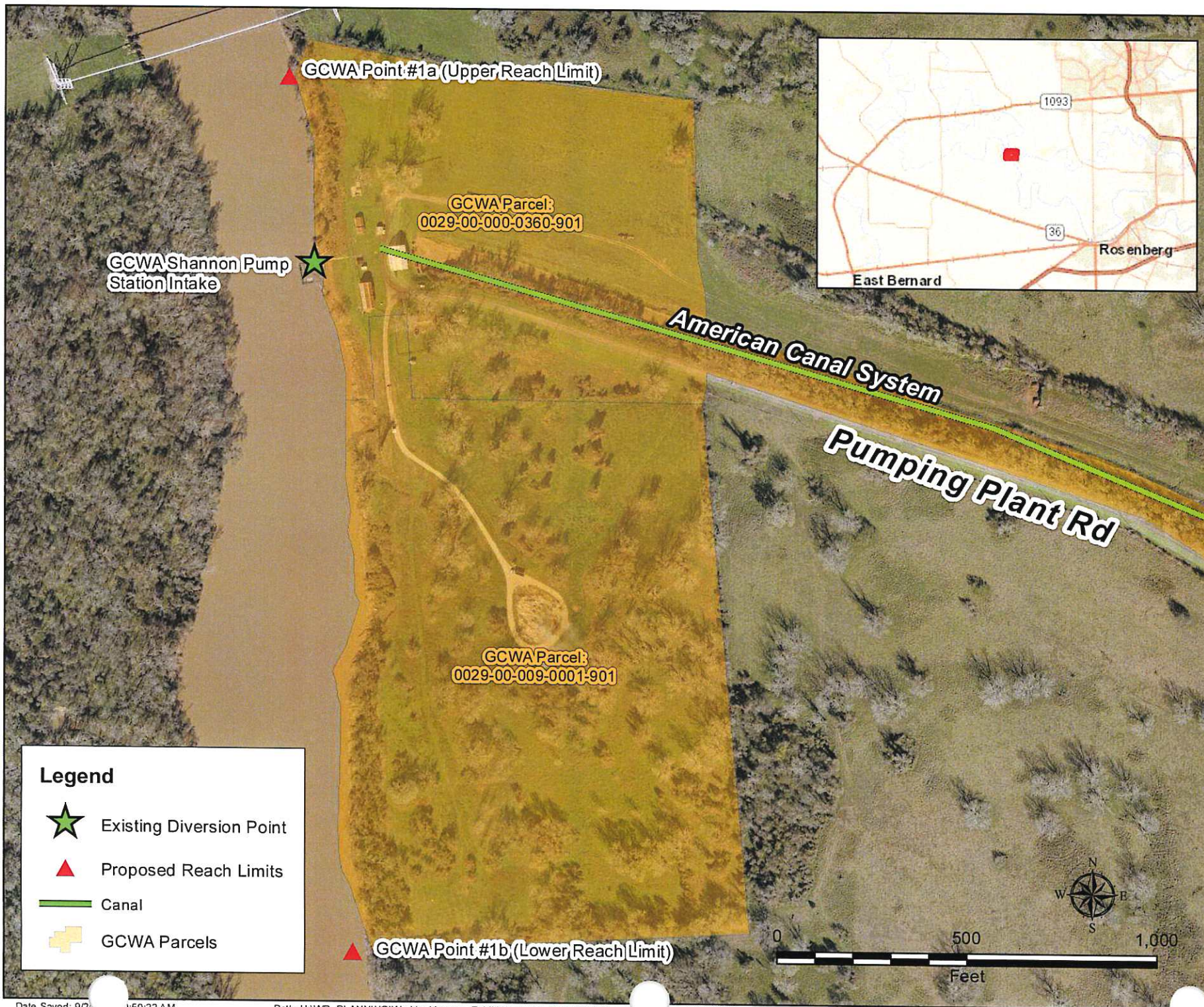
## **Attachment 5**

Addendum to Worksheet 3.0:  
Diversion Point Access Documentation





## **Attachment 5-1:**

Deed and Easement Information for GCWA Reach 1  
(Shannon Pump Station and American Canal)





### Legend

-  Existing Diversion Point
-  Proposed Reach Limits
-  Canal
-  GCWA Parcels

PROJECT NO.	GCWA1910
DATE CREATED	09/20/2018
DATUM & COORDINATE SYSTEM	NAD83 State Plane East Texas SACS NAD83
FILE NAME	AmCan Reach & Reach 20180920
PROJECT LEADER	RT

## GULF COAST WATER AUTHORITY Proposed Water Right Amendment

## American Canal Reach

**FREESE AND NICHOLS, INC.**  
10497 TOWN AND COUNTRY WAY,  
SUITE 600  
HOUSTON, TEXAS 77024  
OFFICE: 713-600-6800  
FAX: 713-600-6801

FIGURE  
A5-1



**Document 5-1(a)**

Property Affidavit of Ownership

THE STATE OF TEXAS

206758

COUNTY OF BRAZORIA

BEFORE ME, the undersigned authority, a Notary Public in and for Brazoria County, Texas, on this day personally appeared D. E. Shannon, who being on oath and duly sworn stated:

"I have been employed by Brazos River Authority since March 5, 1967. Prior to that time I was employed since August 15, 1949 by American Canal Company and American Canal Company of Texas. I am familiar with the property on which is located the pumping plant formerly owned by Brazos Valley Irrigation Company and American Canal Company, American Canal Company of Texas and now owned by Brazos River Authority at which water is pumped from the Brazos River to be flowed through a canal system formerly owned by American Canal Company and now owned by Brazos River Authority. I am familiar with the location of the fences by which a tract of land on which the pumping station is situated is enclosed. I know that the fence along the north line and the east line of said property has been in its present location at least since August 15, 1949. I know that included in the area enclosed by the fence is the tract described on Exhibit "A" attached hereto. This fence, which is and has been at least since August 15, 1949, capable of turning cattle was maintained by American Canal Company, American Canal Company of Texas down to March 5, 1967, and has been maintained by Brazos River Authority since that date. During all of the period of time since August 15, 1949, the property described on Exhibit "A" had been used and claimed by American Canal Company, American Canal Company of Texas and then by Brazos River Authority in connection with the aforesaid pumping plant. During all of this period of time American Canal Company, American Canal Company of Texas, and then Brazos River Authority have claimed the property described on Exhibit "A" under a claim of right and good faith under the deeds by which the pumping plant site was conveyed to them, which deeds are recorded in the Deed Records of Ft. Bend County, Texas. The claim of American Canal Company and American Canal Company of Texas and then of Brazos River Authority to said property was made adversely to everyone, and during such period American Canal Company, American Canal Company of Texas, and then Brazos River Authority had used such property continuously. Such use was uninterrupted and well known in the area. During all such periods the possession by American Canal Company and American Canal Company of Texas and then of Brazos River Authority of such land has been peaceable, not being interrupted by adverse suits to recover same or otherwise interrupted by adverse claim or user."



SUBSCRIBED AND SWORN TO BEFORE ME by D. E. Shannon, on this the

2nd day of March, 1972.

THE STATE OF TEXAS

COUNTY OF BRAZORIA

*D. E. Shannon*  
D. E. SHANNON

*Mary Bea Williams*  
MARY BEA WILLIAMS  
Notary Public in and for Brazoria County, Texas  
My Commission Expires June 1, 1973

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared D. E. Shannon, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.



GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 2nd day of March, 1972.

*Mary Bea Williams*  
MARY BEA WILLIAMS  
Notary Public in and for Brazoria County, Texas  
My Commission Expires June 1, 1973

ATTACHMENT TO AFFIDAVIT SIGNED BY D. E. SHANNON, DATED MARCH 2, 1972, CONCERNING AN APPROXIMATELY TWO (2) ACRE TRACT OF LAND IN THE NORTHEAST CORNER OF LOT 9, CHURCHILL FULSHEAR LEAGUE, ABSTRACT NO. 29, FORT BEND COUNTY, TEXAS:

Two (2) acres of land, more or less, being a part of the Churchill Fulshear League, Abstract No. 29, Fort Bend County, Texas, lying in the Northeast corner of Lot No. 9 of the Subdivision of the Elizabeth Kipp tract and described by metes and bounds as follows:

Beginning at a point which is the Northeast corner of said Lot No. 9; thence South, along the East boundary of said Lot No. 9, 201' to a corner; thence North 76° 30' West 450' to a corner North of and adjacent to a twelve (12) acre tract owned by Brazos River Authority; thence North 166' which is adjacent to part of the twelve (12) acre tract owned by Brazos River Authority; thence South 81° 08' East 446.71' to the Northeast corner of said Lot No. 9 which is the place of beginning.

FILED FOR RECORD

AT 1:25 O'CLOCK P.M.

APR 10 1972

*Ella Masek*

County Clerk, Fort Bend, Co., Tex.

STATE OF TEXAS

COUNTY OF FORT BEND

I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the volume and page of the named records of Fort Bend County, Texas as stamped hereon by me, on



APR 11 1972

*Ella Masek*

COUNTY CLERK, Fort Bend  
County, Texas



**Document 5-1(b)**

1907 Deed

J. M. Frost, et al

Instrument--Deed

To

Dated - - - April 13, 1907

Cane & Rice Belt Irrigation Company

Filed - - - April 18, 1907

Recorded - - Vol. 36, page 471  
Fort Bend County Deed Records

State of Texas,

County of Harris.

Know all men by these presents: That we, Ben Campbell and J.M. Frost, each of Harris County, Texas, for and in consideration of the sum of Five Hundred (\$500.00) Dollars each, each to us in hand paid, by the Cane & Rice Belt Irrigation Company, receipt of which is hereby acknowledged, have Granted, Bargained, Sold and Conveyed and by these presents do Grant, Bargain, Sell and Convey unto the said Cane & Rice Belt Irrigation Company, a private corporation duly organized under and by virtue of the laws of the State of Texas, with its principal office and place of business in Houston, Harris County, Texas, all that certain property situated in Fort Bend County, Texas, described as follows, to-wit:

\*\*\*\*\* (Lands not covered by this abstract) \*\*\*\*\*

And also, all of the rights, privileges and property acquired by J.M. Frost and Ben Campbell, by virtue of certain deeds and contracts hereinafter mentioned, which said deeds and contracts were executed for the purpose of securing a right of way for pipe line from the town of Palshear to the first life of the Cane & Rice Belt Irrigation Company's plant, on the Brazos River, and the said contracts and right of way privileges here referred to being more particularly described as follows, to-wit:

\*\*\*\*\* (Lands not covered by this abstract) \*\*\*\*\*

One executed the 10th day of March, 1906 by Lee Gins and his wife, Fannie Gins to J.M. Frost and Ben Campbell.

\*\*\*\*\* (Lands not covered by this abstract) \*\*\*\*\*

One executed the 13th day of January, 1906, by Ruffin Wilson et ux, Della Wilson, to J.M. Frost and Ben Campbell.

DIXIE ABSTRACT COMPANY (cont'd.)

ROSENBERG, TEXAS

Page No. 63

(Certificate  
#10937)



And the said J.M. Frost and Ben Campbell also transfer, assign and deliver to the said Cane & Rice Belt Irrigation Company all the right, title and interest which they have in and to that certain pipe line, together with the machinery, pumps, pump house and all tools, apparatus and appliances used in connection therewith situated at Gaston Switch on the line of the Aransas Pass R.R. in Fort Bend County, Texas, said pipe line and pipe leading from Gaston Switch to the second lift of the Cane & Rice Belt Irrigation Company.

And all the right, title and interest which the said Ben Campbell and J.M. Frost have in and to the pipe line and pump, machinery, pumps, appliances, tools, as well as the pump house situated at Pulshear, Texas, on the line of the Aransas Pass R.R., said pipe line leading from Pulshear to the first lift of the Cane & Rice Belt Irrigation Company on the Brazos River in said Fort Bend County, Texas;

and all of their right, title and interest in and to those two certain thirty six inch syphons, across the dam on Cottonwood Bayou near the first lift of the Cane & Rice Belt Irrigation Company in Fort Bend County, Texas.

And all their right, title and interest in and to that certain 24 inch living pumps and all pulleys and apparatus belonging thereto, used in 1906 by the Cane and Rice Belt Irrigation Company, at its first lift, said pump being the same that is now installed in the pit of said irrigation plant at the first lift.

To Have and To Hold the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said Cane & Rice Belt Irrigation Company, its heirs and legal representatives forever, and we do hereby bind ourselves, our heirs, executors and administrators to warrant and forever defend all and singular the said premises unto the said Cane & Rice Belt Irrigation Company, its assigns and legal representatives against every person whomsoever lawfully claiming or to claim the same or any part thereof.

Witness our hands at Houston, Harris County, Texas this the 13 day of April, A.D. 1907.

Ben Campbell

J. M. Frost

-3- Notary's Note:

Volume 36, page 471 cont'd.

Fort Bend County Deed Records

State of Texas, )  
County of Harris. )

Before me, Cleveland Sewall, Notary Public in and for Harris County, Texas, on this day personally appeared J. M. Frost and Ben Campbell, each known to me to be the persons whose names are subscribed to the foregoing instrument of writing, and each severally acknowledged to me that they executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office, this the 13th day of April, A.D. 1907.

(Seal) Cleveland Sewall  
Notary Public in and for  
Harris County, Texas.

Filed for record the 18 day of April 1907 at 9 o'clock A.M.

And duly recorded the 1st day of May 1907 at 10:30 o'clock A.M.

C. D. Myers, Clk. Co. Ct.  
Fort Bend Co., Texas

By W. Myers, Dept.

Indemnity bond being required in this connection.

may be done upon request.



**Abstracter's Note:**

With reference to the foregoing pipe line right of way deed or easement we wish to advise that we are not further abstracting same. For the information of the examiner we wish to advise that the record title to the properties of the former Cane & Rice Belt Irrigation Company is an extremely lengthy title and to fully abstract same would entail possibly 250 to 300 pages of abstracting. For the further information of the examiner we wish to advise that the canal system of said former Cane & Rice Belt Irrigation Company is now owned by the American Canal Company of Texas. The last several conveyances of said Canal system do not refer to the preceding instrument among the properties described and it appears to us that the pipe line granted as shown herein has probably been abandoned and is no longer considered a part of the properties of said American Canal Company of Texas. If further abstracting is required in this connection same can be done upon request.

\_\_\_\_\_  
Deputy

\_\_\_\_\_  
County Clerk

**Document 5-1(c)**

1927 Deed



STATE OF TEXAS  
COUNTY OF FORT BEND

KNOW ALL MEN BY THESE PRESENTS:

That we, W. P. Winner, and *Vance Hay Winner*  
husband and wife, of Fort Bend County, Texas, for ten (\$10.00) Dollars,  
to us in hand paid by The Sugarland Industries of Fort Bend County,  
Texas, and for other valuable consideration, the receipt of which is  
hereby acknowledged, have granted, sold and conveyed and by these  
presents do grant, sell and convey unto The Sugar Land Industries,  
of Sugar Land, Fort Bend County, Texas, a trust estate, having as  
its trustees, I. H. Kempner and D. W. Kempner, of Galveston, Texas,  
and G. D. Ulrich and W. T. Eldridge, Jr. of Sugar Land, Texas, all  
that certain tract or parcel of land in Fort Bend County, Texas, des-  
cribed by metes and bounds as follows:

Containing 12 acres more or less, and being a  
part of the Churchill Fulshear League Abstract  
No. 29, a part of Lot No. 9 of the subdivision of  
Elizabeth Kipp tract, a map of said tract being  
recorded in Vol. "O" page 19, of the Deed records  
of Fort Bend County, Texas, being about 10 miles  
northwest of Richmond, and fronting on the Brazos  
River and being a part of a tract of 40 acres  
deeded by J. W. Blakely to Henry Wilson by deed  
dated Sept. 5, 1885 and recorded in Vol. "R" on  
pages 15 and 16, Deed Records of Fort Bend County,  
Texas, to which reference is here made; and described  
by metes and bounds as follows:

BEGINNING at the low water line of the East Bank of  
the Brazos River at the southwest corner of that  
portion of said lot number 9 formerly owned by  
Henry and Adele Wilson; Thence North 85 deg. East  
with their south line 1018 feet to a stake for  
corner in West line of Samuel Briscoe tract now  
owned by W. P. Winner;  
Thence North with the East line of said Lot No.  
9 and the West line of said Briscoe tract 550  
feet to a stake for corner; Thence North 76 deg.  
30' west 450 feet to stake for corner; Thence  
North 166 feet to a stake; Thence North 76 deg.  
30' to the low water line in said Brazos River;  
Thence down said Brazos River with its low water  
line of its East Bank to the place of beginning.

*Pump 211*  
1018'

TO HAVE AND TO HOLD the above described premises, to-  
gether with all and singular the rights and appurtenances thereto in  
anywise belonging unto the said The Sugarland Industries, its successors  
and assigns for ever; and we do hereby bind ourselves, our heirs, exe-  
cutors and administrators to warrant and forever defend all and singular  
the said premises unto the said The Sugarland Industries, its successors  
and assigns, against whomsoever lawfully claiming or to claim the same,  
or any part thereof.

Witness our hands this 5 day of Sept A.D. 1927.

*W. P. Winner*  
*Vance Hay Winner*

STATE OF TEXAS

COUNTY OF FORT BEND

Before me, the undersigned authority, on this day personally appeared, W. P. Winner, and *Vance Hay Winner* his wife, known to me to be the persons whose names are subscribed to the foregoing instrument, and the said W. P. Winner acknowledged to me that he executed the same for the purposes and consideration therein expressed. And the said *Vance Hay Winner* wife, of the said W. P. Winner, having been examined by me privily and apart from her husband, and having the same fully explained to her, she, the said *Vance Hay Winner*, acknowledged such instrument to be her act and deed, and declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

Given under my hand and seal this 5<sup>th</sup> day of Sept

A. D. 1927.

*H. D. Schurz*  
Notary Public in and for Fort Bend County, Tex.

THE STATE OF TEXAS,  
County of Fort Bend.

I, IMOGENE MULLINAX CHANCE, County Clerk in and for said County, do hereby certify that the foregoing instrument, dated the 5<sup>th</sup> day of Sept, 1927, with its Certificate of Authentication, was filed for record in my office the 14 day of Sept, A. D. 1927, at 8:15 o'clock A M., and duly recorded the 15 day of Sept, A. D. 1927, at 8:30 o'clock A M., in the Deed Records of said County, in Vol. 116 on Page 508.

WITNESS my hand and the seal of the County Court of said County, at office in Richmond, Texas, the day and year last above written.

Deputy.

*Imogene Mullinax Chance*  
Clerk County Court, Fort Bend County, Texas



**Document 5-1(d)**

1932 Deed

7cc

Tracts 3 & 4  
unit 1

STATE OF TEXAS,                   |  
                                  | KNOW ALL MEN BY THESE PRESENTS:  
COUNTY OF FORT BEND.       |

THAT, The Sugarland Industries, a trust estate having as its trustees, I. H. Kempner and D. W. Kempner, of Galveston County, Texas, and G. D. Ulrich and W. T. Eldridge, of Fort Bend County, Texas, operating under a declaration of trust dated January 1, 1919, as amended and extended by agreement dated January 1, 1929, said instruments being recorded in the Deed Records of Fort Bend County, Texas, for and in consideration of Ten (\$10.00) Dollars and other valuable consideration to it paid by Brazos Valley Irrigation Company, a Texas corporation, has GRANTED, SOLD and CONVEYED, and by these presents does GRANT, SELL and CONVEY unto the said Brazos Valley Irrigation Company those two certain tracts or parcels of land in Fort Bend County, Texas, described by metes and bounds as follows:

Tract 3

FIRST TRACT:

Containing 12 acres (more or less) and being a part of the Churchill Fulshear League in Fort Bend County, Texas, Abstract No. 29, a part of Lot No. 9 of the subdivision of Elizabeth Kipp tract, a map of said tract being recorded in Volume "O", Page 19, of the Deed Records of Fort Bend County, Texas, being about 10 miles Northwest of Richmond, and fronting on the Brazos River and being a part of a tract of 40 acres deeded by J. W. Blakely to Henry Wilson by deed dated Sept. 5, 1885, and recorded in Volume "R" on Pages 15 and 16, Deed Records of Fort Bend County, Texas, to which reference is here made, and described by metes and bounds as follows:

BEGINNING at the low water line of the East Bank of the Brazos River at the Southwest corner of that portion of said lot No. 9 formerly owned by Henry and Adele Wilson; Thence North 85 degrees East with their South line 1018 feet to a stake for corner in the West line of Samuel Briscoe tract now owned by W. P. Winner; Thence North with the East line of said Lot No. 9 and the West line of said Briscoe tract 550 feet to a stake for corner; Thence North 76 degrees 30' West 450 feet to a stake for corner; Thence North 166 feet to a stake; Thence North 76 degrees 30' West to the low water line in said Brazos River;

Thence down said Brazos River with its low water line of its East Bank to the place of beginning.

SECOND TRACT:

Containing 13.86 acres of land out of the Churchill Fulshear and Randon and Pennington Leagues, and being all the land lying and being within 50 feet of the hereinafter described center line. Said center line begins at a point on the East line of Lot No. 9 of the subdivision of the Elizabeth Kipp tract, a part of the Fulshear League, 642 feet South of the Northwest corner of the Samuel Briscoe tract, now owned by W.P. Winner, and the Southwest corner of the Sol Harris tract, and in the East line of a 12-acre tract deed to B. D. Hurd by Henry and Adele Wilson; said center line runs thence South 73 degrees East 1038 feet to the West end of Briscoe Lake; Thence South 59 degrees East through said lake, 2115 feet, passing the East line of the said Fulshear League and the West line of said Randon and Pennington League at 1784 feet; Thence North 80 degrees 30 minutes East 925 ft. to the East end of Briscoe Lake; Thence North 39 degrees and 30 minutes East 1960 feet to the Jones Creek,

TRACT #4

TO HAVE AND TO HOLD the above-described premises, together with all and singular the rights and appurtenances thereto in anywise belonging, unto the said Brazos Valley Irrigation Company, its successors and assigns forever, and we do hereby bind ourselves, our successors and assigns, to warrant and forever defend, all and singular, the aforesaid premises unto Brazos Valley Irrigation Company, its successors and assigns, against every person whomsoever lawfully claiming, or to claim, the same or any part thereof through, by and/or under us.

IN TESTIMONY WHEREOF, The Sugarland Industries has caused this instrument to be executed by its above-named trustees, and attested by its Secretary, J. Vickerman, this 20th day of April, 1932.

THE SUGARLAND INDUSTRIES,

By J. H. Kempner  
D. Kempner  
P. D. Vickerman  
W. T. Edridge  
TRUSTEES.

ATTEST:

J. Vickerman  
Secretary.

STATE OF TEXAS,       |  
                          |  
COUNTY OF GALVESTON. |

BEFORE ME, the undersigned authority, on this day personally appeared I. H. Kempner and D. W. Kempner, known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they executed the same, as Trustees of The Sugarland Industries, for the purposes and consideration therein expressed, and as the act and deed of the said The Sugarland Industries, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 29th day of April, 1932.

M. H. Murff  
Notary Public, in and for Galveston County, Tex.

STATE OF TEXAS,       |  
                          |  
COUNTY OF FORT BEND. |

BEFORE ME, the undersigned authority, on this day personally appeared G. D. Ulrich and W. T. Eldridge, known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they executed the same, as Trustees of The Sugarland Industries, for the purposes and consideration therein expressed, and as the act and deed of the said The Sugarland Industries, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS 30th day of April, 1932.

L. D. Dineen  
Notary Public, in and for Fort Bend County, Texas.



STATE OF TEXAS  
COUNTY OF CAMERON

RETURNED TO THE UNDERSIGNED, on this day  
personally appeared I. W. Ketchum and J. W. Ketchum, known  
to me to be the persons whose names are subscribed to the  
foregoing instrument, and acknowledged to me that they ex-  
ecuted the same, as witnesses of the foregoing instrument, for  
the purpose and consideration therein expressed, and as the  
act and deed of the said The Sugarland Industries, and in the  
capacity therein stated.

WITNESSED my hand and seal of office this 2<sup>nd</sup> day of April, 1935.

*H. M. Lehman*  
Notary Public, in and for Fort Bend County, Texas.

THE STATE OF TEXAS,  
County of Fort Bend.

I, NANNIE M. LEHMAN, County Clerk in and for said County, do hereby certify that the foregoing instrument, with its Certificate of Authentication, was filed for record in my office the 3<sup>rd</sup> day of May A. D. 1935, at 8 o'clock A. M., and duly recorded the 9<sup>th</sup> day of May A. D. 1935, at 9:35 o'clock A. M., in the 138<sup>th</sup> Vol. on Page 170 records of said County, in

WITNESS my hand and the seal of the County Court of said County, at office in Richmond, Texas, the day and year last above written.

By *Nannie M. Lehman* Deputy.  
Clerk County Court, Fort Bend County, Texas.

*H. M. Lehman*  
Notary Public, in and for Fort Bend County, Texas.

Completed 18932

Augaland Industries

20

Barago Valley Bridge

Seed.

Completed

FIELD FOR RECORDING

Aug 3 - Aug 10 May 1932

18

David M. Johnson

Contract for Seed Co, Texas

Aug 2 net

Augaland Industries  
Augaland, Stephens

**Document 5-1(e)**

General Land Office Easement

TEXAS



GENERAL LAND OFFICE

JERRY PATTERSON, COMMISSIONER

September 14, 2011

Nancy Matthews  
Gulf Coast Water Authority  
3630 Highway 1765  
Texas City, TX 77591-4824

Re: Miscellaneous Easement No. ME20000059  
Fort Bend County, Texas

Dear Ms. Matthews:

Enclosed are two originals of the contract for the above referenced project. A consideration of \$6,350.00 has been assessed.

Please sign both original contracts before a notary public and return them, along with a check in the amount of \$6,350.00, made payable to the Commissioner of the General Land Office (GLO), to the attention of Asset Inspection, to the address below within twenty (20) days of receipt of this letter. This figure represents the 10-year land-use fee and the required \$350.00 application fee. If the \$350.00 filing fee has been previously submitted, please remit only the \$6,000.00 consideration.


Please return the enclosed invoice with your signed contracts and payment. This will ensure that the payment is properly credited to your account.

When the contracts are received and executed by the GLO one original will be returned to you and one retained for our files.

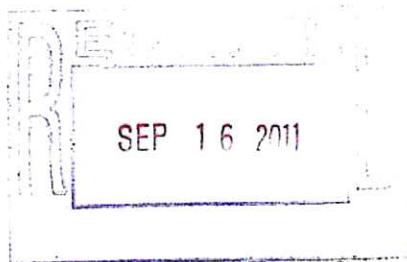
Submission of the signed and notarized contracts to the GLO will constitute Gulf Coast Water Authority's acceptance of all contract provisions. **Please note all Special Conditions and requirements stated in the contract.**

If you have any questions, please email me at [Ryan.Hancock@glo.texas.gov](mailto:Ryan.Hancock@glo.texas.gov) or call me at (512) 463-5222.

Sincerely,

  
Ryan Hancock  
Asset Inspection

Enclosures



Texas General Land Office

Stephen F. Austin Building • 1700 North Congress Avenue, Texas 78701-1495

Post Office Box 12873 • Austin, Texas 78711-2873

Phone: 512-463-5001 • 800-998-4GLO

[www.glo.state.tx.us](http://www.glo.state.tx.us)

MELtr2\_08 11 11



# USE THIS STATEMENT, AS THE FIRST PAGE, WHEN RETURNING THE SIGNED CONTRACT



## Invoice for Account C000005947

Texas General Land Office - Jerry Patterson, Commissioner  
PO Box 12873 Austin, TX 78711-2873

**Customer Service (800) 998-4456 7:30am – 5:30pm Monday – Friday**

### Customer Information

Gulf Coast Water Authority  
3630 Highway 1765  
Texas City, TX 77591-4824

Statement date: 9/14/11  
CustomerID: C000005947

Activity Description  
Water Intake

### Invoice Summary

Contract Term: Effective Date 07/01/2010 Expiration Date 06/30/2020  
Total Consideration Payment: \$6,350.00

### Amount Due

Invoice Date	Due Date	Lease Number	Description	GLA	Amount
9/14/11	10/04/2011	ME20000059 AUS33934	Fee	3301040	\$350.00
9/14/11	10/04/2011	ME20000059 AUS33934	Rental Payment	3340027	\$6,000.00
<b>Total Due</b>					<b>\$6,350.00</b>

Preparer: rhancock

CustomerID: C000005947

SEP 16 2011

# MISCELLANEOUS EASEMENT

## The State of Texas



Austin, Texas

### MISCELLANEOUS EASEMENT No. ME20000059

STATE OF TEXAS

§

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND

§

§

This Miscellaneous Easement, ME20000059 (the "Agreement"), is granted by virtue of the authority granted in Section 51.291, et seq., TEX. NAT. RES. CODE, 31 TEX. ADMIN. CODE §13.12, et seq., and all other applicable statutes and rules, as the same may be amended from time to time, and is subject to all applicable regulations promulgated from time to time.

#### ARTICLE I. PARTIES

1.01. In consideration of the mutual covenants and agreements set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the STATE OF TEXAS, acting by and through the Commissioner of the General Land Office (the "GRANTOR"), hereby grants to Gulf Coast Water Authority, a Texas government, whose address is 3630 Highway 1765, Texas City, TX 77591-4824, phone number (409) 935-2438, (the "Grantee"), a non-exclusive easement for the purposes identified in Article V.

#### ARTICLE II. PREMISES

2.01. The easement is located across State-owned land in Fort Bend County, Texas, described as follows:

A 0.097 Acre Tract of Land (4,428 square feet) in the Brazos River in the Churchill Fulshear League, Abstract 29, Fort Bend County, Texas (the "Premises").

The Premises are further described or depicted on the Vicinity Map attached hereto as Exhibit A, the Survey Map attached hereto **and the metes and bounds description attached hereto** as Exhibit B, collectively incorporated by reference for all purposes.

2.02. Grantee acknowledges and agrees that when the Improvements (as hereinafter defined) are placed on the Premises, the location of such Improvements within the easement shall thereby become fixed at such location and shall not be changed except by an amendment to this Agreement signed by both parties hereto and subject to any approval by any other governmental agency with jurisdiction over same.

2.03. GRANTEE HAS INSPECTED THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES AND ACCEPTS THE SAME "AS IS", IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. THE GRANTOR DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER WARRANTY WHATSOEVER NOT EXPRESSLY SET FORTH IN THIS AGREEMENT. THE GRANTOR AND GRANTEE HEREBY AGREE AND ACKNOWLEDGE THAT THE USE OF THE TERM "GRANT" IN NO WAY IMPLIES THAT THIS EASEMENT IS FREE OF LIENS, ENCUMBRANCES AND/OR PRIOR RIGHTS. NOTICE IS HEREBY GIVEN TO



GRANTEE THAT ANY PRIOR GRANT AND/OR ENCUMBRANCE MAY BE OF RECORD AND GRANTEE IS ADVISED TO EXAMINE THE RECORDS IN THE ARCHIVES AND RECORDS DIVISION OF THE GENERAL LAND OFFICE, 1700 NORTH CONGRESS AVENUE, AUSTIN, TEXAS 78701-1495, AND ALL OTHER LAND TITLE RECORDS OF THE COUNTY IN WHICH THE PREMISES ARE LOCATED.

### ARTICLE III. TERM

3.01. This Agreement is for a period of ten (10) years, beginning on July 1, 2010, and ending on June 30, 2020, unless renewed, amended, or sooner terminated as authorized by law or as set forth herein.

3.02. Provided that Grantee has complied with all provisions of this Agreement to the complete satisfaction of the GRANTOR, Grantee shall have the right to extend and renew this Agreement for an additional term of ten (10) years by taking the following actions:

(i) not later than one hundred eighty (180) days prior to expiration of the term of this Agreement, provide written notice to the GRANTOR of Grantee's intent to renew the Agreement;

(ii) complete and submit to the GRANTOR for approval, an application for renewal within thirty (30) days following receipt of the application;

(iii) pay the applicable renewal fee, pursuant to the rate schedule in effect at the time of renewal; and

(iv) if required by the GRANTOR, provide documentation of the location of the Improvements and, if applicable, a burial survey.

### ARTICLE IV. CONSIDERATION AND TAXES

4.01. A. As consideration ("Consideration") for the granting of this easement, Grantee agrees to pay the GRANTOR (payable to the Commissioner of the General Land Office at Austin, Texas) the sum of Six Thousand And 00/100 Dollars (\$6,000.00), due and payable upon the execution of this Agreement.

B. Past due Consideration and other past due payments shall bear interest as provided in TEX. NAT. RES. CODE Section 51.301, as amended from time to time. Failure of Grantee to make a payment on or before the date the same becomes due shall, at the GRANTOR'S option, make all payments due and payable immediately.

4.02. In addition to the above, Grantee shall pay and discharge any and all taxes, general and special assessments, and other charges which during the term of this Agreement may be levied on or assessed against the Premises or the Improvements constructed thereon, provided such taxes result from Grantee's use of this easement. Grantee shall pay such taxes, charges, and assessments not less than five (5) days prior to the date of delinquency thereof directly to the authority or official charged with the collection thereof. Grantee shall have the right in good faith at its sole cost and expense to contest any such taxes, charges, and assessments, and shall be obligated to pay the contested amount only if and when finally determined to be owed.

4.03. Grantee agrees to and shall protect and hold the GRANTOR harmless from liability for any and all such taxes, charges, and assessments, together with any penalties and interest thereon, and from any sale or other proceeding to enforce payment thereof.

## ARTICLE V. USE OF THE PREMISES

5.01. Grantee and Grantee's employees, contractors, and agents shall have the right to use the Premises for a right-of-way to construct, maintain, operate, inspect, and repair an intake structure for the purpose of gathering non-potable water (the "Improvements"). Grantee shall not use the Premises for any other purpose without first obtaining written consent of the GRANTOR, which consent may be granted or withheld in the GRANTOR'S sole discretion.

5.02. A. The GRANTOR and Grantee hereby acknowledge and agree that each shall have reciprocal rights of ingress and egress to and from the Premises across contiguous or adjacent State-owned land or land owned by Grantee, provided in the exercise of this right the GRANTOR and Grantee agree not to unreasonably interfere with the other party's (or that party's agents, assignees, or designees) use of its property. Grantee shall have the right of ingress and egress for the purposes of constructing, maintaining, operating, inspecting, and repairing the Improvements and such right is not granted for any other purpose. Grantee and the GRANTOR mutually agree to use contiguous or adjacent State-owned land or land owned by Grantee, respectively, only to the extent and for the length of time necessary to provide access to and from the Premises. Notwithstanding any other provisions to the contrary, no easement is created by this Section 5.02; instead, a license is granted to the parties and their respective officers, employees, agents and contractors for the limited purposes set forth herein.

B. Grantee acknowledges and agrees that the GRANTOR'S right of ingress and egress described in Section 5.02.A. of this Agreement shall be and remain in effect as long as the Improvements and any other structure placed on the Premises by Grantee remain on the Premises and/or as necessary for the GRANTOR to confirm the removal (in whole or in part) of the Improvements. Such right of ingress and egress shall survive the expiration or earlier termination of this Agreement.

5.03. Grantee shall be fully liable and responsible for any damage, of any nature, arising or resulting from any act or omission of Grantee or Grantee's officers, employees, agents, contractors and invitees, which are related to the exercise of the rights granted in this Article V.

5.04. A. Grantee's use of the Premises is subject to and contingent upon compliance with the following covenants, obligations and conditions (the "Special Conditions"):

1. Grantee is responsible for maintaining all structures authorized under this contract in good repair and safe condition, and in compliance with all existing state and federal regulations governing such work.
2. Grantee is required to perform mitigation and/or pay surface damage fees according to the Grantor's policy in effect at the time damages occur for any and all surface damages resulting from actions of Grantee's employees, contractors, and/or agents during the term of this easement. If mitigation is required Grantee will be notified in writing by the Grantor of the terms and conditions under which the mitigation shall be conducted. Such mitigation and/or payment of damage fees shall be performed in the manner and within the time frame specified in written notice provided by the Grantor to Grantee following said damages.
3. Grantee is required to provide the Grantor an "as built" survey of the Improvements within 180 days of contract execution. Grantee agrees to provide the documentation showing the current location of the Improvements. This documentation shall include spatial coordinates sufficient for determining that the Improvements lie within the approved Premises. Upon receipt and acceptance by the Grantor, the "as built" survey shall be attached to and become a part of this Agreement as Exhibit "B-1" and shall be included in the Premises as described in Section 2.01 of this Agreement. Notwithstanding the foregoing, and provided that the Improvements have been in place for at least twenty (20) years ("a legacy improvement"),



Grantee may, in lieu of providing such actual dimensions and spatial coordinates, satisfy the requirements of Article III §3.02(iv) by providing a certified written statement by a Professional Engineer which states that the engineer, despite having employed best efforts to do so, can not ascertain the burial depth and/or location coordinates of such legacy Improvement from Grantee's existing records and documentation. Any such certified statement shall also include any documentation in Grantee's possession relating to either the actual dimensions or spatial coordinates of the Improvements. If Grantee, at any time, later discovers or determines the actual burial depth and/or location coordinates of a legacy Improvement, Grantee agrees to submit such documentation to Grantor. If it is determined that the Improvements or legacy Improvements are not actually located within the Premises as described in this Agreement, the Grantee shall, at the time of submission of the as built survey or other documentation, provide written notice to Grantor of the discrepancy. The Grantor will then provide written notice to the Grantee of the amount of additional consideration, if any, due to the Grantor as a result of the discrepancy. Grantee agrees to pay the additional consideration within 30 days of receipt of the written notice from Grantor. Failure to pay the additional consideration within the time specified will constitute an event of default under Article IX of this Agreement. Grantee acknowledges that Grantee's failure to submit the as built survey of the Improvements, or certified statement by a Professional Engineer for legacy Improvements, within 180 days, or for new projects, upon completion of construction, will result in a waiver by Grantee of any claim to a reduction or refund of consideration tendered or to be tendered under this Agreement that may have resulted from any discrepancy. In addition Grantor may, at its discretion, require an amendment to this Agreement with regard to the description of the Premises.

B. Prior to any construction, installation or other activities on the Premises, Grantee shall provide written notice of all Special Conditions, if any, to any contractor and/or agent involved in such activities. Grantee shall send a copy of such notice to the General Land Office, ATTN: Asset Inspection, 1700 N. Congress Avenue, Austin, Texas 78701-1495.

5.05. The GRANTOR, its agents, representatives and employees shall have the right to enter upon the Premises at any reasonable time (or any time in case of emergency) for purposes of inspection, repair (and Grantee agrees to repay the Grantor the reasonable cost thereof on written demand) and any other purpose necessary to protect the GRANTOR'S interests therein. Further, the GRANTOR shall have the right to use or to permit the use of any or all of the Premises for any purpose deemed, in the GRANTOR'S sole discretion, to be consistent with Grantee's easement grant.

5.06. Grantee shall not use, or permit the use of the Premises for any illegal purpose. Grantee shall comply, and will cause its officers, employees, agents, contractors and invitees to comply, with all applicable laws, ordinances, rules, and regulations of governing agencies concerning use of the Premises.

5.07. Failure by Grantee to construct, maintain and operate the Improvements in accordance with this Article V shall render such Improvements "unauthorized structures" under TEX. NAT. RES. CODE §51.302.

#### ARTICLE VI. ASSIGNMENTS

6.01. GRANTEE SHALL NOT ASSIGN THE PREMISES OR THE RIGHTS GRANTED HEREIN, IN WHOLE OR PART, TO ANY THIRD PARTY FOR ANY PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF THE GRANTOR, WHICH MAY BE GRANTED OR DENIED IN THE GRANTOR'S SOLE DISCRETION. ANY UNAUTHORIZED ASSIGNMENT SHALL BE VOID AND OF NO EFFECT, AND SUCH ASSIGNMENT SHALL NOT RELIEVE GRANTEE OF ANY LIABILITY FOR ANY



OBLIGATION, COVENANT, OR CONDITION OF THIS AGREEMENT. THIS PROVISION, AND THE PROHIBITION AGAINST ASSIGNMENT CONTAINED HEREIN, SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS AGREEMENT. FOR PURPOSES OF THIS AGREEMENT, AN ASSIGNMENT IS ANY TRANSFER, INCLUDING BY OPERATION OF LAW, TO ANOTHER OF ALL OR PART OF THE PROPERTY, INTEREST OR RIGHTS HEREIN GRANTED.

#### ARTICLE VII. PROTECTION OF NATURAL and HISTORICAL RESOURCES

7.01. Grantee shall use the highest degree of care and all appropriate safeguards to: (i) prevent pollution of air, ground, and water in and around the Premises, and (ii) to protect and preserve natural resources and wildlife habitat. Grantee shall comply with all applicable rules and regulations of the General Land Office, the School Land Board, and other governmental agencies responsible for the protection and preservation of public lands and waters. In the event of pollution or an incident that may result in pollution of the Premises or adjacent property which is the result of Grantee's (or Grantee's employees, contractors, and agents) acts or omissions, Grantee shall immediately notify the GRANTOR, use all means reasonably available to recapture any pollutants which have escaped or may escape, and mitigate for any and all natural resources damages caused thereby.

7.02. GRANTEE IS HEREBY EXPRESSLY NOTIFIED OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966, (PB-89-66, 80 STATUTE 915, 16 U.S.C.A. SECTION 470, ET.SEQ.) AND THE TEXAS ANTIQUITIES CODE [TITLE 9, CHAPTER 191, TEX. NAT. RES. CODE]. IN CONFORMANCE WITH THESE LAWS, IN THE EVENT THAT ANY SITE, FOUNDATION, BUILDING, STRUCTURE, LOCATION, OBJECT, ARTIFACT, ITEM OR OTHER FEATURE OF ARCHEOLOGICAL, SCIENTIFIC, EDUCATIONAL, CULTURAL, OR HISTORIC INTEREST IS ENCOUNTERED DURING THE ACTIVITIES AUTHORIZED BY THIS AGREEMENT, GRANTEE SHALL IMMEDIATELY CEASE ANY AND ALL ACTIVITIES, AND NOTIFY THE COMMISSIONER OF THE GENERAL LAND OFFICE AND THE TEXAS HISTORICAL COMMISSION, P.O. BOX 12276, AUSTIN, TEXAS 78711, SO THAT APPROPRIATE ACTION MAY BE TAKEN. In the event that Grantee is required to cease activities, the GRANTOR shall not be liable for any costs of Grantee, Grantee's agents, employees, contractors, subcontractors, or any other person or entity as a result of any interruption of Grantee's activities or inability to use the Premises as herein contemplated.

#### ARTICLE VIII. INDEMNITY and INSURANCE

8.01. GRANTEE SHALL BE FULLY LIABLE AND RESPONSIBLE FOR ANY DAMAGE, OF ANY NATURE, ARISING OR RESULTING FROM ITS OWN ACTS OR OMISSIONS RELATED TO ITS EXERCISE OF THE RIGHTS GRANTED HEREIN. GRANTEE AGREES TO AND SHALL INDEMNIFY AND HOLD THE GRANTOR, THE GRANTOR'S OFFICERS, AGENTS, AND EMPLOYEES, HARMLESS FROM AND AGAINST CLAIMS, SUIT, COSTS, LIABILITY OR DAMAGES OF ANY KIND, INCLUDING STRICT LIABILITY CLAIMS, WITHOUT LIMIT AND WITHOUT REGARD TO CAUSE OF THE DAMAGES OR THE NEGLIGENCE OF ANY PARTY, EXCEPT FOR THE CONSEQUENCES OF THE NEGLIGENT ACTS OR WILLFUL MISCONDUCT OF THE GRANTOR, THE GRANTOR'S OFFICERS, AGENTS, EMPLOYEES, OR INVITEES, ARISING DIRECTLY OR INDIRECTLY FROM GRANTEE'S USE OF THE PREMISES (OR ANY ADJACENT OR CONTIGUOUS STATE-OWNED LAND) OR FROM ANY BREACH BY GRANTEE OF THE TERMS, COVENANTS OR CONDITIONS CONTAINED HEREIN.

8.02. A. Grantee agrees to either (i) purchase and maintain a Required Policy (as hereinafter defined) of insurance coverage, or (ii) provide Financial Documentation (as hereinafter defined) to the GRANTOR. Grantee agrees to deliver or cause to be delivered to the GRANTOR and/or the GRANTOR'S designee either, as applicable: (i) a certificate of insurance for any Required Policy or (ii) Financial Documentation, within ten (10) days of execution of this Agreement. At all times during the term of this Agreement, Grantee shall cause the required evidence of insurance coverage or financial capacity to be deposited with the GRANTOR. If Grantee fails to do so, such failure may be treated by the GRANTOR as a default by Grantee under this Agreement.



B. The phrase "Required Policy" shall mean the policy of insurance required to be maintained by Grantee under the rules promulgated by the General Land Office and/or the School Land Board. Such Required Policy shall insure against any and all loss or damage as may be required by rule (including, without limitation, coverage for bodily injury, death, property damage, premises and operations, products liability, contractual liability, and/or strict liability). Any Required Policy shall name the GRANTOR (and any of its successors and assigns designated by the GRANTOR) as an additional insured.

C. The phrase "Financial Documentation" shall mean a financial statement and/or other evidence of financial responsibility or capacity which is determined to be satisfactory to the GRANTOR.

#### ARTICLE IX. DEFAULT, TERMINATION and EXPIRATION

9.01. If, following 30 days prior written notice from the GRANTOR specifying a default or breach, Grantee fails to pay any money due hereunder or is in breach of any term or condition of this Agreement, the GRANTOR shall have the right, at its option and its sole discretion, to terminate this Agreement and all rights inuring to Grantee herein by sending written notice of such termination to Grantee in accordance with Article XI of this Agreement. Upon sending of such written notice, this Agreement shall automatically terminate and all rights granted herein to Grantee shall revert to the GRANTOR. Such termination shall not prejudice the rights of the GRANTOR to collect any money due or to seek recovery on any claim arising hereunder.

9.02. A. Except as otherwise provided in subsection B, Grantee shall, within one hundred twenty (120) days from the date of expiration or sooner termination of this Agreement, remove all personal property, structures, and the Improvements, and shall restore the Premises (and any other property affected by such removal activities) to the same condition that existed before Grantee entered thereon. Such removal and restoration activities shall be conducted in accordance with General Land Office guidelines in effect at the time of removal/restoration which may include, without limitation, specific removal techniques required for protection of natural resources, and mitigation or payment in lieu of mitigation for any and all damages resulting from removal activities. Grantee shall notify the GRANTOR at least ten (10) days before commencing removal/restoration activities so that a field inspector may be present.

B. Pursuant to 31 TEX. ADMIN. CODE §13.13(c)(1), the GRANTOR may waive the removal/restoration requirements in this Section 9.02 if, in the GRANTOR'S sole opinion and discretion, such waiver is in the best interest of the Grantor. Any such waiver shall be in writing and may be conditioned upon factors including, without limitation, the nature and sensitivity of the natural resources in the area, potential damage to or destruction of property, beneficial uses of the existing Improvement(s), and other factors considered to be in the best interest of the GRANTOR.

#### ARTICLE X. HOLDOVER

10.01. If Grantee holds over and continues in possession of the Premises after expiration or earlier termination of this Agreement, Grantee will be deemed to be occupying the Premises on the basis of a month-to-month tenancy subject to all of the terms and conditions of this Agreement, except that as liquidated damages by reason of such holding over, the amounts payable by Grantee under this Agreement shall be increased such that the Consideration payable under Section 4.01 of this Agreement and any other sums payable hereunder shall be two hundred percent (200%) of the amount payable to the GRANTOR by Grantee for the applicable period immediately preceding the first day of the holdover period. Grantee acknowledges that in the event it holds over, the GRANTOR'S actual damages will be difficult, if not impossible, to ascertain, and the liquidated damages herein agreed to be paid are reasonable in amount and are payable in lieu of actual damages and are not a penalty. Grantee further acknowledges that acceptance of hold over Consideration does not imply GRANTOR consent to hold over.

10.02. The tenancy from month-to-month described in Section 10.01 of this Agreement may be terminated by either party upon thirty (30) days written notice to the other.

10.03. The Consideration due after notice of termination has been given is to be calculated according to Section 10.01 hereinabove on a pro rata basis. If upon notice of termination by the GRANTOR, Grantee pays Consideration in excess of the amount due and payable and the GRANTOR accepts such payment, the acceptance of such payment will not operate as a waiver by the GRANTOR of the notice of termination unless such waiver is in writing and signed by the GRANTOR. Any such excess amounts paid by Grantee and accepted by the GRANTOR shall be promptly refunded by the GRANTOR after deducting therefrom any amounts owed to the GRANTOR.

#### ARTICLE XI. NOTICE

11.01. Any notice which may or shall be given under the terms of this Agreement shall be in writing and shall be either delivered by hand, by facsimile, or sent by United States first class mail, adequate postage prepaid, if for the GRANTOR to Deputy Commissioner, Professional Services, addressed to his attention, 1700 North Congress Avenue, Austin, Texas 78701-1495, FAX: (512) 463-5098, and if for Grantee, to it at 3630 Highway 1765, Texas City, TX 77591-4824, and FAX: (409) 935-4156. Any party's address may be changed from time to time by such party by giving notice as provided above, except that the Premises may not be used by Grantee as the sole notice address. No change of address of either party shall be binding on the other party until notice of such change of address is given as herein provided.

11.02. For purposes of the calculation of various time periods referred to in this Agreement, notice delivered by hand shall be deemed received when delivered to the place for giving notice to a party referred to above. Notice mailed in the manner provided above shall be deemed completed upon the earlier to occur of (i) actual receipt as indicated on the signed return receipt, or (ii) three (3) days after posting as herein provided.

#### ARTICLE XII. INFORMATIONAL REQUIREMENTS

12.01. A. Grantee shall submit to the GRANTOR, within one hundred eighty (180) days following installation or construction of the Improvements authorized in this Agreement, an "as-built" survey and field notes prepared by a surveyor duly licensed by the State of Texas. The as-built survey shall be conducted in accordance with the GRANTOR'S survey requirements attached hereto as Exhibit C. Failure or refusal by Grantee to timely provide the as-built survey when due hereunder and the continuance of such failure for thirty (30) consecutive days after the receipt of the GRANTOR'S written notice to Grantee specifying such failure may be treated as a default by Grantee hereunder and the GRANTOR may, in addition to any other remedy and in the GRANTOR'S sole discretion, terminate this Agreement and require removal of any personal property and the Improvements located on the Premises in accordance with Section 9.02 of this Agreement.

B. Upon receipt of the as-built survey, prepared in accordance with this Section 12.01, the GRANTOR shall compare the as-built survey with the proposed location of the Improvements, as represented by Grantee's application to the GRANTOR and set forth in Section 2.01 hereof. If there are any changes or discrepancies in the location of the Improvements authorized by this Agreement, the GRANTOR may, in its sole discretion, either (i) terminate this Agreement and require removal and/or relocation of the Improvements upon written notice to Grantee, or (ii) replace Exhibit "B" attached hereto with a substitute corrected exhibit denoted "Exhibit B-1". The substitute shall be the as-built survey, signed by both parties, and, upon attachment hereto, Exhibit "B" shall be void and of no further effect.

12.02. If all or any part of the Improvements are buried, Grantee shall submit to the GRANTOR, one hundred eighty (180) days following installation or construction of the Improvements, a "burial survey" prepared by a surveyor duly licensed by the State of Texas. The burial survey shall be conducted in accordance with the GRANTOR'S survey requirements attached hereto as Exhibit C. Failure or refusal by Grantee to timely provide the burial survey when



due hereunder and the continuance of such failure for thirty (30) consecutive days after the receipt of the GRANTOR'S written notice to Grantee specifying such failure may be treated as a default by Grantee hereunder and the GRANTOR may, in addition to any other remedy and in the GRANTOR'S sole discretion, terminate this Agreement and require removal of any personal property and the Improvements located on the Premises in accordance with Section 9.02 of this Agreement.

12.03. Grantee shall provide written notice to the GRANTOR of any change in Grantee's name, address, corporate structure, legal status or any other information relevant to this Agreement.

12.04. Grantee shall provide to the GRANTOR any other information reasonably requested by the GRANTOR in writing within fifteen (15) days following such request or such other time period approved by the GRANTOR (such approval not to be unreasonably withheld).

12.05. Except with regard to initial construction/installation of the Improvements and emergencies, prior to conducting any activities at the Premises which may materially impact natural resources in or around the Premises, Grantee shall provide written notice to the GRANTOR describing the proposed activities in detail and any procedures which will be used to protect natural resources. Such notice shall be provided by Grantee to the GRANTOR at least sixty (60) days prior to conducting re-burial activities, and at least thirty (30) days prior to conducting major repairs, modification, or other activities. Grantee acknowledges and agrees that the GRANTOR shall have at least twenty (20) days following receipt of the notice to review the proposed activities and to impose specific conditions for conducting such activities which, in the GRANTOR'S sole determination, are necessary to protect natural resources or to mitigate for actual damages to natural resources. If the GRANTOR has not provided notice to Grantee within twenty (20) days following receipt of Grantee's notice, the GRANTOR is deemed to have approved, subject to the terms of this Agreement, the proposed activities to be conducted at the Premises. In case of emergencies, Grantee may undertake all actions necessary to prevent imminent injury or damage to public health, safety or welfare, and/or to protect natural resources. Within twenty-four (24) hours following such emergency actions, Grantee shall provide notice to the GRANTOR of such actions as hereinabove provided. (If not during normal business hours, call 1-800-832-8224).

12.06. Grantee hereby acknowledges that late submission by Grantee to the GRANTOR of information (including, without limitation, as-built and/or burial surveys) required under this Agreement will cause the GRANTOR to incur various expenses not contemplated by this Agreement, the exact amount of which are presently difficult to ascertain. Accordingly, if any information required to be submitted within a certain time under the terms of this Agreement shall not be received by the GRANTOR on or before five (5) days after the date when due, then, Grantee shall pay to the GRANTOR a "Late Charge" equal to one hundred dollars (\$100.00) for each day so past due. The GRANTOR and Grantee agree that such Late Charge represents a fair and reasonable estimate of the expenses that the GRANTOR will incur by reason of such late submission of information by Grantee. Acceptance of such Late Charge by the GRANTOR shall not constitute a waiver of Grantee's default with respect to any such past due information, nor prevent the GRANTOR from exercising any other rights and remedies granted under this Agreement, at law, or in equity.

### ARTICLE XIII. MISCELLANEOUS PROVISIONS

13.01. With respect to terminology in this Agreement, each number (singular or plural) shall include all numbers, and each gender (male, female or neuter) shall include all genders. If any provision of this Agreement shall ever be held to be invalid or unenforceable, such invalidity or unenforceability shall not affect any other provisions of the Agreement, but such other provisions shall continue in full force and effect.

13.02. The titles of the Articles in this Agreement shall have no effect and shall neither limit nor amplify the provisions of the Agreement itself. This Agreement shall be binding upon and shall accrue to the benefit of the

GRANTOR, its successors and assigns, Grantee, Grantee's successors and assigns (or heirs, executors, administrators and assigns, as the case may be); however, this clause does not constitute a consent by the GRANTOR to any assignment by Grantee, but instead refers only to those instances in which an assignment is hereafter made in strict compliance with Article VI above, or in the case of a deceased natural person grantee, refers to the instances previously referred to in this sentence and also circumstances in which title to Grantee's interest under this Agreement passes, after the demise of Grantee, pursuant to Grantee's will or the laws of intestate succession. The words "hereof," "herein," "hereunder," "hereinafter" and the like refer to this entire agreement, not just to the specific article, section or paragraph in which such words appear.

13.03. Neither acceptance of Consideration (or any portion thereof) or any other sums payable by Grantee hereunder (or any portion thereof) to the GRANTOR nor failure by the GRANTOR to complain of any action, non-action or default of Grantee shall constitute a waiver as to any breach of any covenant or condition of Grantee contained herein nor a waiver of any of the GRANTOR'S rights hereunder. Waiver by the GRANTOR of any right for any default of Grantee shall not constitute a waiver of any right for either a prior or subsequent default of the same obligation or for any prior or subsequent default of any other obligation. No right or remedy of the GRANTOR hereunder or covenant, duty or obligation of Grantee hereunder shall be deemed waived by the GRANTOR unless such waiver be in writing, signed by a duly authorized representative of the GRANTOR.

13.04. No provision of this Agreement shall be construed in such a way as to constitute the GRANTOR and Grantee joint venturers or co-partners or to make Grantee the agent of the GRANTOR or make the GRANTOR liable for the debts of Grantee.

13.05. In all instances where Grantee is required hereunder to pay any sum or do any act at a particular indicated time or within an indicated period, it is understood that time is of the essence.

13.06. Under no circumstances whatsoever shall the GRANTOR ever be liable hereunder for consequential damages or special damages. The terms of this Agreement shall only be binding on the GRANTOR during the period of its ownership of the Premises, and in the event of the transfer of such ownership interest, the GRANTOR shall thereupon be released and discharged from all covenants and obligations thereafter accruing, but such covenants and obligations shall be binding during the Agreement term upon each new owner for the duration of such owner's ownership.

13.07. All monetary obligations of the GRANTOR and Grantee (including, without limitation, any monetary obligation for damages for any breach of the respective covenants, duties or obligations of either party hereunder) are performable exclusively in Austin, Travis County, Texas.

13.08. The obligation of Grantee to pay all Consideration and other sums hereunder provided to be paid by Grantee and the obligation of Grantee to perform Grantee's other covenants and duties under this Agreement constitute independent, unconditional obligations to be performed at all times provided for hereunder, save and except only when an abatement thereof or reduction therein is expressly provided for in this Agreement and not otherwise. Grantee waives and relinquishes all rights which Grantee might have to claim any nature of lien against, or withhold or deduct from or offset against, any Consideration or other sums provided hereunder to be paid to the GRANTOR by Grantee. Grantee waives and relinquishes any right to assert, either as a claim or as a defense, that the GRANTOR is bound to perform or is liable for the nonperformance of any implied covenant or implied duty of the GRANTOR not expressly set forth in this Agreement.

#### ARTICLE XIV. FILING

14.01. Grantee shall, at its sole cost and expense, record this Agreement in the Fort Bend County Real Property Records and provide a file marked copy to the GRANTOR within 60 days after this Agreement is executed by all parties.

#### ARTICLE XV. ENTIRE AGREEMENT

15.01. This Agreement ME20000059, including exhibits, constitutes the entire agreement between the GRANTOR and Grantee and no prior written or prior or contemporaneous oral promises, warranties or representations shall be binding. This Agreement shall not be amended, changed, altered, assigned or extended except by written instrument signed by all parties hereto.

15.02. This Agreement shall become effective only upon execution by all parties hereto and delivery of a fully executed counterpart to each party.



IN TESTIMONY WHEREOF, witness my hand and Seal of Office.

GRANTOR: THE STATE OF TEXAS

GRANTEE: GULF COAST WATER  
AUTHORITY

By:

JERRY E. PATTERSON

Commissioner, General Land Office

By:

Name: David A. Sauer

Title: Interim General Manager

Date:

11/2/2011

Date:

10/21/11

APPROVED:

Contents:

Legal:

Deputy:

Executive:

### ACKNOWLEDGMENT

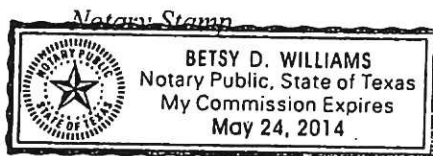
STATE OF Texas §

COUNTY OF Galveston §

This instrument was acknowledged before me on the 21<sup>st</sup> day of October, 20 11,

by David A. Sauer  
(Grantee representative signing this document)

Betsy D. Williams  
(Notary Signature)



Notary Public, State of Texas

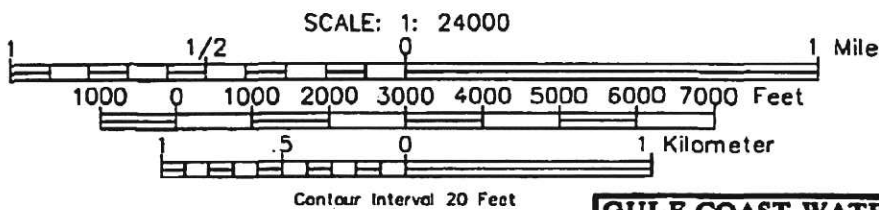
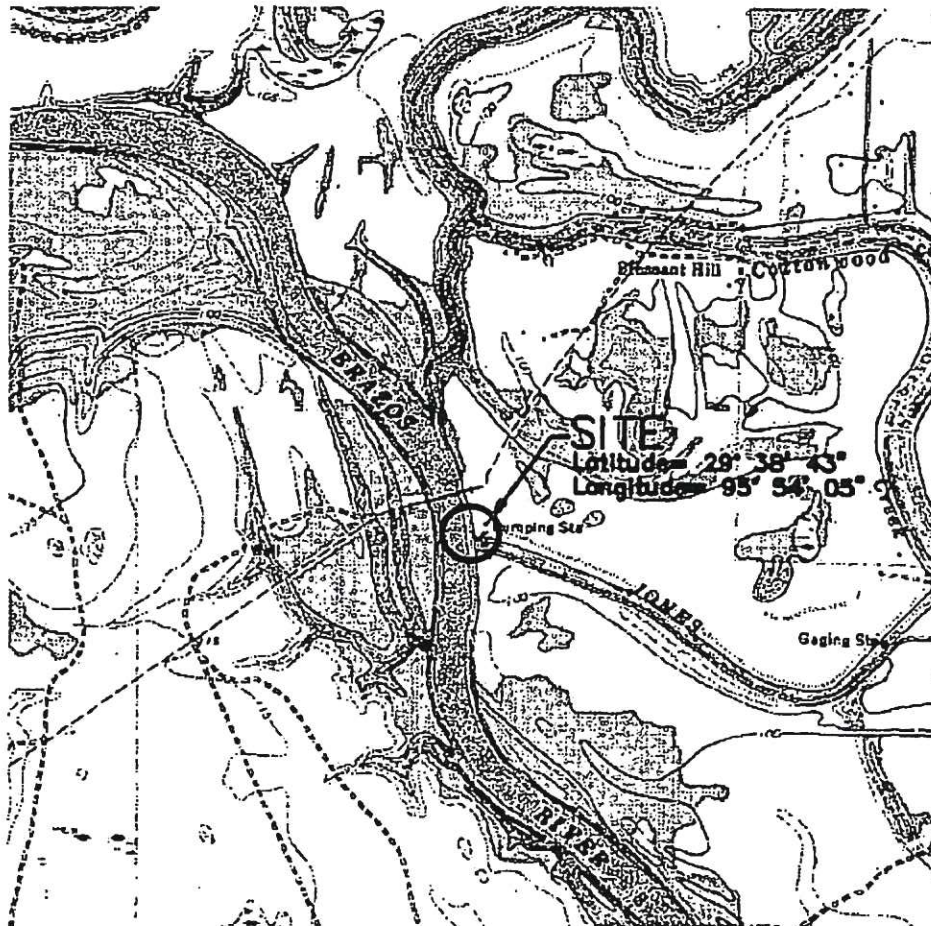
My commission expires: 5/24/2014



# VICINITY MAP

Exhibit A  
ME20000059

## BRAZOS RIVER, FORT BEND COUNTY, TEXAS



SOURCE: PULSHEAR, QUADRANGLE, FORT BEND COUNTY, TEXAS

**GULF COAST WATER AUTHORITY**  
3630 HWY 1785 TEXAS CITY, TEXAS 77391  
D.E. SHANNON PUMP STATION  
FORT BEND COUNTY BRAZOS RIVER

## EXHIBIT A VICINITY MAP

DATE: FEBRUARY, 2000 BY: **FE**

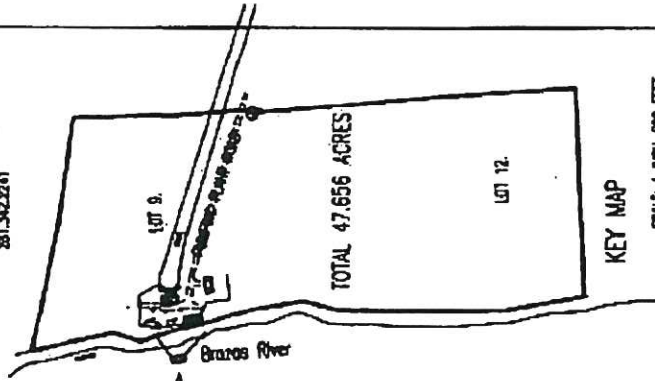
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# SURVEY MAP

Exhibit B  
ME810173  
Page 1 of 5

## EXHIBIT B

EXHIBIT B  
APPLICANT: GULF COAST WATER AUTHORITY  
2500 HIGHWAY 1705  
TEXAS CITY, TEXAS 77591  
PROJECT: D.E. SHANNON PUMP STATION  
PREPARED BY: HENRY STEINLAMP, JR., INC.  
Land Boundary & Topographic Surveying  
500 Fifth Street  
Houston, Texas 77001  
281.342.2241



PLAT SHOWING LOCATION OF PROPOSED  
STRUCTURE IN BRAZOS RIVER ADJOINING  
ACRE TRACT (VOL. 2059, P.C. 2245;  
ORFBECK) IN THE CHURCHILL FULSHEAR  
LEAGUE, AB. 29;  
FORT BEND COUNTY, TEXAS.

I, Franklin R. Schoedel, A Registered Professional Land Surveyor, do hereby  
certify that this plat is a true record of a survey as made on the ground.

APRIL 21, 2000

Franklin R. Schoedel  
Surveyor

DAVE L. WARRICK, JR.  
438.780 ACRES  
VOL. 550, P.C. 462, DISTRICT

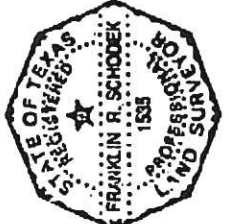
S 79°08'15" E-577.50'  
S 82°37'47" E-446.77'  
N 78°05'36" W-453.05'  
S 01°22'16" E-417.77'  
S 04°36'39" E-279.61'  
S 01°55'38" E-38.0'

GULF COAST WATER AUTHORITY  
S-A  
1,864 ACRES

LOT 9.

GULF COAST WATER AUTHORITY  
A-1-1  
CALL FIRST TRACT-120 ACRES  
VOL. 151, P.C. 172, DISTRICT

TOTAL 47.656 ACRES



GULF COAST WATER AUTHORITY  
A-1-2  
CALL FIRST TRACT-20 ACRES  
VOL. 121, P.C. 301, DISTRICT  
OCTOBER 1, 1928

GULF COAST WATER AUTHORITY  
CALL 500 ACRES  
VOL. 2059, P.C. 2245, DISTRICT  
JULY 20, 1985

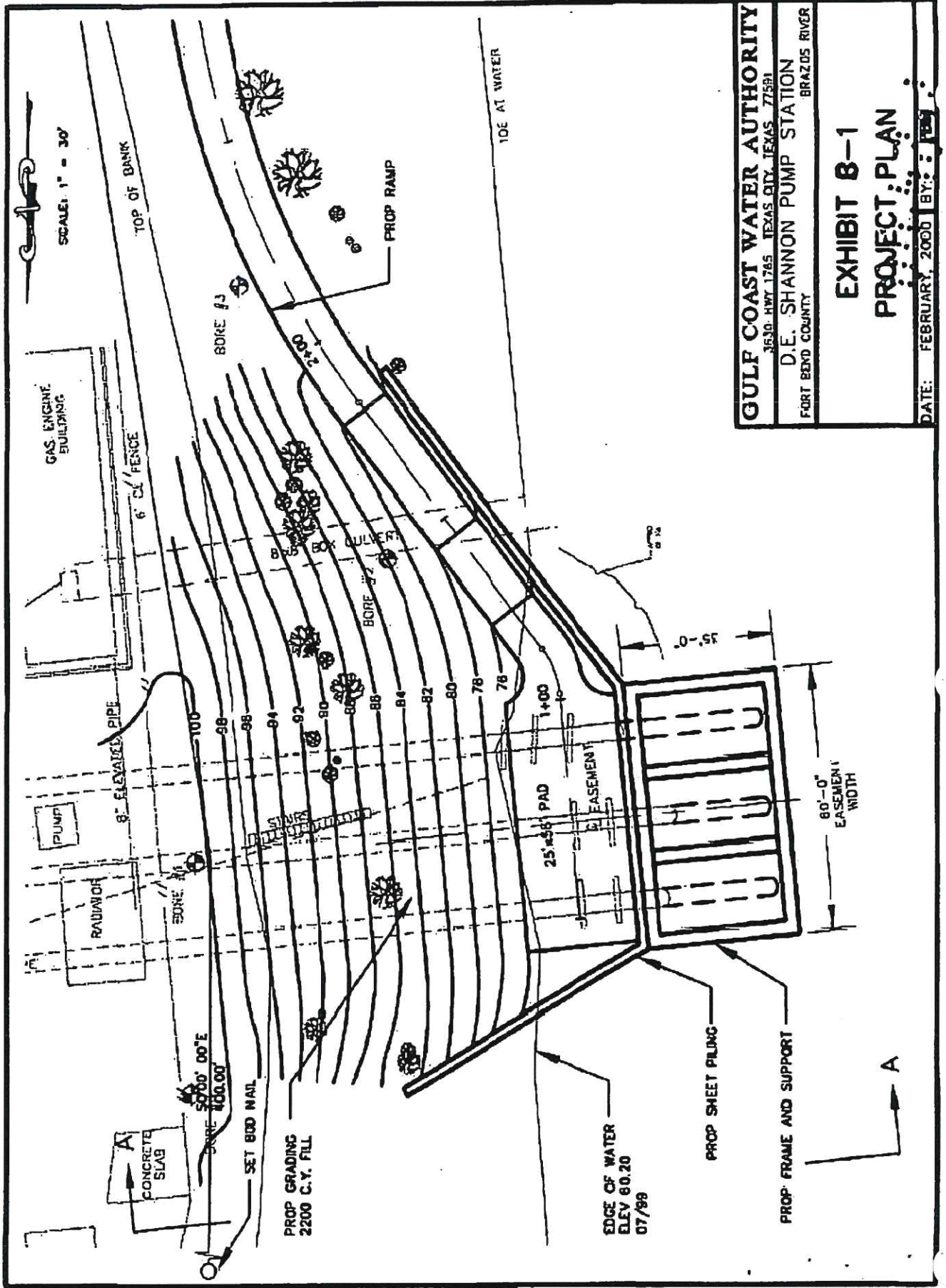
NOTE: All bearings and coordinates referenced to the  
Texas Plane Coordinate System, South Central Zone.

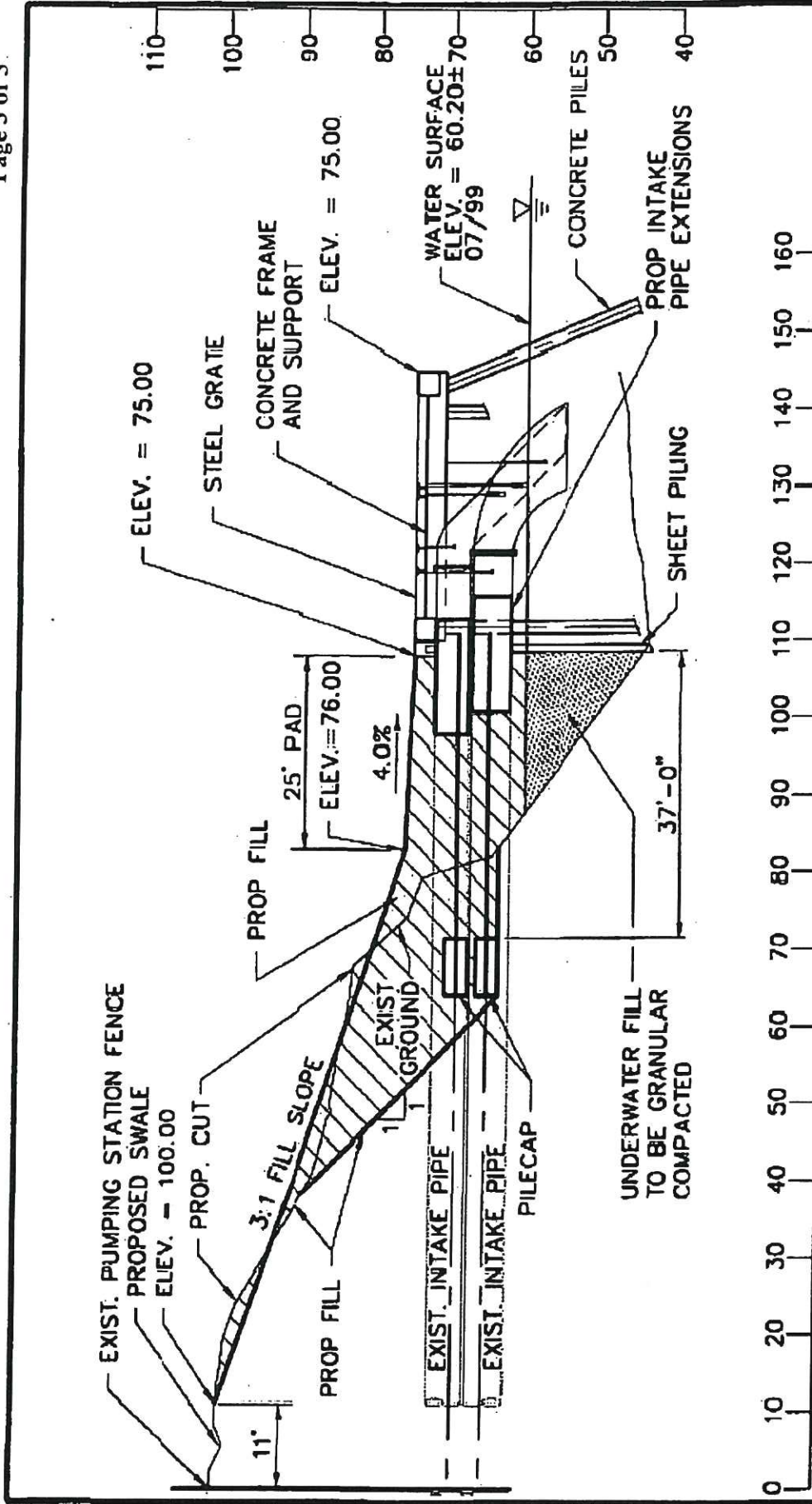
SCALE: 1 INCH = 200 FEET

Brazos River

NOTES:  
1. 27°11'40" E-38.0 FEET 2.  
N 57°11'40" E-30.0 FEET 3.  
S 08°53'30" E-42.0 FEET 4.  
S 00°08'41" E-49.20 FEET 5.  
N 42°05'14" W-30.0 FEET 6.  
S 87°11'40" W-30.0 FEET 7.  
N 07°48'14" W-30.0 FEET 1.  
CALCULATED AREA = 0.007 ACRES  
428 SQUARE FEET







SCALE: 1" = 20'

<b>GULF COAST WATER AUTHORITY</b>	
3530 HWY 1765	TEXAS CITY, TEXAS 77591
D.E. SHANNON PUMP STATION	
FORT BEND COUNTY	
BR 4705 RIVER	
<b>EXHIBIT B-2</b>	
<b>TYPICAL SECTION</b>	
DATE: FEBRUARY, 2000	BY: [Signature]



**HENRY STEINKAMP, JR. INC.**  
Land Boundary & Topographic Surveying  
909 Fifth Street  
P.O. Box 192  
Rosenberg, Texas 77471  
281/342-2241

Franklin R. Schodek  
Registered Professional Land Surveyor

James L. Syptak, Sr.  
Registered Professional Land Surveyor

June 20, 2000

A Field Note Description of a 0.097 Acre Tract of Land (4428 square feet) in the Brazos River and adjoining the Gulf Coast Water Authority 47.656 Acre Tract (Volume 2059, Page 2245; of the Official Records of Fort Bend County, Texas) in the Churchill Fulshear League, abstract 29, Fort Bend County, Texas.

All bearings and distances referenced to the Texas Plane Coordinate System, South Central Zone (Surface).

For Connection Begin at a 3/4 inch iron pipe found in concrete marking the Northeast corner of said Gulf Coast Water Authority 47.656 Acre Tract; said corner being the Northeast corner of Lot 9 of the Subdivision of the Elizabeth Kipp Tract recorded in Volume 0, Page 19 of the Deed Records and being the Northwest corner of Lot 10 of said Subdivision of the Elizabeth Kipp Tract and of the Highland Management Inc. 52.0 Acre Tract (Volume 1438, Page 632; Deed Records); THENCE, North 82deg. 37' 47" West, 446.77 feet to a 3/4" iron pipe found marking the Northwest corner of the Gulf Coast Water Authority 1.864 Acre Tract 3-A and the Northerly Northeast corner of the Gulf Coast Water Authority Call 12 Acre Tract A-1-1 (Volume 138, Page 170; Deed Records) and being in the South line of the Dan J. Harrison, Jr. 458.766 Acre Tract (Volume 550, Page 463; Deed Records; THENCE, South 62deg. 47' 05" West, 453.62 to a railroad spike set as a control point and having NAD 83 Longitude W. 95deg. 54' 06.50847", NAD 83 Latitude N. 29deg. 38' 44.25722", X=2952479.932, Y=13795325.821; which bears North, 05deg. 15' 39" West, 534.05 feet from a 5/8" iron rod set for reference; THENCE, South 37deg. 35' 34" West, 359.80 feet to the Northwest corner of a proposed structure and Northwest corner of and Place of Beginning for this Tract;

THENCE, North 82deg. 11' 46" East, 35.0 feet to corner;

THENCE, North 57deg. 11' 46" East, 30.0 feet to corner;

THENCE, Southerly along the East Water's Edge of the Brazos River with the following courses and distances;

FieldN\_0.097\_A1.wps

Page 2.  
0.097 Acre  
Fort Bend County, Texas.

South, 08deg. 53' 32" East, 42.69 feet to point;  
South, 00deg. 06' 41" East, 59.20 feet to point marking the Southeast corner of  
this Tract;

THENCE, North 42deg. 48' 14" West, 35.0 feet to a point for corner;

THENCE, South, 82deg. 11' 46" West, 35.0 feet to a point for corner;

THENCE, North 07deg. 48' 14" West, at 30.0 feet pass a point with the following  
location: NAD 83 Longitude W. 95deg. 54' 09", NAD 83 Latitude N. 29deg. 38' 41",  
X=2952264.512, Y=13795011.004, in all 60.0 feet to the place of beginning and  
containing 0.097 Acre of Land.

Signed: John N. Scholtz

# Instructions for Preparing Exhibits for the following General Land Office Applications:

Exhibit C  
ME20000059

## Miscellaneous Easements (Rights-of-Way) Sub-Surface Easements

Maps (or plats) showing the location of proposed and as-built projects on state-owned lands are required as part of the General Land Office (GLO) application process. The following instructions are to be followed when applying for new work (proposed project), or for reporting as-built conditions for a previously approved project, when the activity is a **Miscellaneous Easement (Right-of-way/ROW), Surface Lease, or Sub-Surface Easement** on state land.

The information specified below represents minimum requirements of the GLO and additional information may be requested on a project-by-project basis to facilitate a full evaluation of the proposed activity.

The information should be submitted along with the required application form and processing fees. Each map or plat must conform to the specifications contained herein. An application is not considered complete, and processing of the application will not be initiated, until all information requested has been submitted and GLO staff has determined that it is adequate.

NOTE: Surveys and survey plats required by other entities, Federal, State, County and/or City, are PERMISSIBLE and USABLE for GLO applications provided they meet the following requirements.

### **IF SUBMITTING SURVEY PLATS DIGITALLY, PLEASE PROVIDE THE INFORMATION IN ONE OF THE FOLLOWING FORMATS:**

1. In an ESRI format (i.e. Shape file, E00, or Geodatabase)
2. AutoDesk Map 6 or earlier version in a DWG format.
3. **And Projection Information of the data set submitted.**

#### **A. GENERAL INSTRUCTIONS for ALL APPLICATIONS:**

1. Each map or plat should be 8-1/2" x 11".
2. A one-inch margin should be left at the top edge of each sheet for binding purposes.
3. Any shading used to identify specific areas must be reproducible by ordinary copy machines.
4. Each map or plat submitted must have a title block identifying, at a minimum: (a) applicant name; (b) applicant address; (c) project name; (d) date of preparation; (e) name of preparer, and (f) project location as follows:
  - (1) if on state-owned uplands, then provide county, survey name (original grantee) and, as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number;
  - (2) if on submerged land, then provide county name, waterbody name, and state tract number;
5. The scale for each map or plat must be clearly indicated both digitally and by graphic scale.
6. Vicinity Maps -- Exhibit A for each project application must be a Vicinity Map showing the general location of the proposed work. The Vicinity Map must be produced using a U.S.G.S. 7.5 minute Topographic Map, a Texas Department of Transportation County Road Map, or navigation chart as its base layer. A prominent arrow on the map should indicate the project location. An 8 1/2" x 11" Xerox copy from the original Topo, county map, or navigation chart showing the project location is sufficient. It is not necessary to submit the entire Topo or county map, so long as the map is appropriately identified as to the origin of the base information (e.g., name, and date of base map information used). This is most easily accomplished by copying the legend of the base map and making it part of the Vicinity Map.



7. Project Site Map -- Exhibit B for each project application should be a Project Site Map (in Survey Plat format), which provides specific project location information. The Project Site Map should be produced at sufficient scale and detail to enable field inspectors to locate the project on the ground with minimal difficulty. Demographic features such as road numbers, stream names, railroad crossings, corporate city limits, and other prominent locative features should be included on the Project Site Map. A prominent arrow on the map should indicate the project location and a North arrow must be provided. Annotation may be included on the map regarding distance of the project from known points (e.g., highway intersections, road stream crossings, etc.). **Additional guidance for preparing Project Site Maps is provided in Section B of this document.**

8. Detailed Project Plan -- Exhibit C for each project application should be a Detailed Project Plan, consisting of an aerial plan-view drawing and a cross-sectional drawing of all proposed or existing structures on state-owned lands at the project site.

Page 1 of the Detailed Project Plan should contain, at a minimum:

- a. Location of the shoreline or banks if the project is on or adjacent to tidally influenced waters or crosses a state-owned river, stream, creek, or bayou.
- b. The direction of ebb and flow if in or adjacent to tidal waters, or the direction of water flow if the project crosses a river, creek, stream, or bayou.
- c. A North arrow.
- d. The location of state tract lines (on tidally influenced lands), survey lines, or property lines, as applicable.
- e. The location of any marshes, submerged grass flats, oyster reefs, mud or sand flats, or other sensitive natural/cultural resources known to exist in the project area.
- f. The lines of mean high water and mean low water when applicable.
- g. Dimensions of all structures (existing and proposed) that will encumber state-owned lands at the project site.
- h. The registration, easement, or lease numbers for any structures at the site previously authorized by the GLO (available from GLO field offices upon request).
- i. Any applicable Corps of Engineers application numbers covering the proposed work, as soon as that application number is available, but, in any event, prior to issuance of the easement.

Page 2 of the Detailed Project Plan should contain, as applicable, an explanation of construction methodology, techniques, and equipment that will be used at the site.

9. As-Built Survey -- A survey showing the depth of burial must be furnished for all projects on state-owned tidally influenced lands (Gulf of Mexico, bays, estuaries, etc.), crossings of state-owned rivers/streams/creeks/bayous. The survey shall show plan view only for projects on state-owned upland tracts. Failure to provide this information is, by terms of the state contract, grounds for termination of the easement and removal of the structure from state-owned land.

**New Installations:** Each application for installation of a new power transmission line or communication line must include with the application a profile drawing showing the proposed depth of burial at not less than 36" below the surface.

GLO will issue an easement using the proposed ROW and depth of burial information. Following installation of the line, however, the applicant is required by terms of the GLO contract to provide a survey of actual burial depth measurements for that portion of the ROW length occupying state-owned land. The spacing between depth-of-burial measurement points is a function of the length of ROW. If the easement length is less than 500 feet, the depth of cover of the structure and waterway bottom elevation shall be determined at intervals not to exceed 50 feet. If the easement length is greater than 500 feet but less than 5,000 feet the interval between measurement points shall be 100 feet. Easements greater than 5,000 feet in length shall be surveyed at 250-foot intervals.

All work shall be performed under the supervision of and sealed by a registered public land surveyor. All submitted drawings must be sealed by the supervising registered public land surveyor. All elevations must be referenced to a common datum (Mean Sea Level, National Geodetic Vertical Datum, Mean Low Water, etc.) and grid coordinates must reference Texas State Plane coordinate System of 1927 or 1983. The accuracy of the waterway bottom and installation elevations shall be +/- one-half (.5') foot for the waterway bottom and +/- one-half (0.5') foot for depth of burial less than or equal to 10 feet and +/- fifteen (15%) percent for depth of burial greater than ten (10) feet. Manual probing and electronic means (both active and passive) of survey type shall be acceptable for depth of burial determinations.

**Existing Installations:** At time of renewal of an easement for an existing underground power transmission line or communication line, provide the data as required under Section 3.02.(iv) of this easement contract.



**B. SPECIFIC INSTRUCTIONS:**

Maps or Survey Plats to be submitted as the Project Site Map and/or the Detailed Project Plan (see A7 and 8 above) must contain the information described below.

Upland survey data should be reported to normal boundary land surveying minimum standards. Offshore or submerged sites shall be located to a specified accuracy of +/- 5 feet of any reported location.

**1. Projects located on Tidally Influenced State-owned lands** (Including the Gulf of Mexico, bay tracts, and the tidally influenced portions of rivers, creeks, streams, and bayous):

**a. Rights-of-Way (e.g., Miscellaneous Easements for transmission lines, roads, etc.)**

Coordinates must be provided at the beginning and ending points of the ROW's centerline, or on the principal point or points of tracts described by other means (directional well bores, etc.). These coordinates must be based on the Texas State Plane Coordinate System of 1927 or 1983. Courses and distances must be specified as either grid or geodetic for all centerlines and perimeter lines, and ties must be made from specific improvements (e.g., well heads, platforms, pilings, etc.) to a corner or corners of the lease or easement tract. All submerged state land tracts crossed by any part of the ROW must be shown and identified, and the points of each ROW crossing of a state-tract boundary identified in the Texas State Plane Coordinate System of 1927 or 1983. The distance between crossings of a state-tract boundary must be indicated in both feet and rods on the plat.

As-built plats (and confirmation surveys at time of renewal) must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the ROW, the plat shall provide a minimum of one identified point for each 1,000 feet of ROW length. A ROW less than 1,000 feet long but greater than 500 feet in length requires one mid-point to be identified on the survey plat.

**b. Surface Leases (e.g., well platforms on un-leased tracts, etc.)**

A metes and bounds description (or other valid description) must be provided for the area encumbered by a surface lease. This description must be in increments of not less than one acre for the area surrounding a platform or structure, with the point of beginning, well location, and other structures on the leased site identified and properly located by coordinates. The point of reference from either the center or the corner of a platform or structure must be specified, with coordinates given at one or more points on the Texas State Plane Coordinate System of 1927 or 1983.

**c. Sub-Surface Easements (e.g., directionally drilled well bores, etc.)**

Sub-surface easements for directionally drilled well bores shall consist of a corridor having a ten (10) foot radius around the directionally drilled well bores as it is shown by an as-built directional well survey. Directional well surveys shall show the following information: surface location (as described in item B.1.b., above), sub-surface elevation of each angle point, and the bottom hole location as shown on well bore log. These items shall be identified by a value given at not less than one point on any locative document, referenced to the Texas State Plane Coordinate System of 1927 or 1983.

**2. Projects Across (Rights-of-Way) State-owned Upland Property, or the state-owned portion of a river, creek, stream, or bayou above the limit of tidal influence:**

**a. Upland Tract (State Fee Lands):**

For new project applications, information provided for projects on state-owned upland tracts shall include the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the proposed easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with the survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the ROW easement.

At completion of construction, or at time of renewal, an as-built plat or confirmation survey (which ever is applicable) must be submitted. This plat must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the ROW, the plat shall provide a minimum of one identified point for each 1,000 feet of ROW length. ROWs, less than 1,000 feet long but greater than 500 feet long, require one mid-point to be identified on the survey plat.

b. Crossing the State-owned portion of a river, creek, stream, or bayou above the limit of tidal influence.

Information provided for projects crossing non-tidal state-owned rivers, creeks, streams, or bayous shall include an identification of the stream or water body by local and any other names known (historic, from topographic or other maps, etc.). In addition, the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with a cross section or profile of the crossing between the top of the high banks, survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the ROW easement.



# CONSTRUCTION PLANS FOR INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION FOR **D.E. SHANNON PUMPING STATION** FORT BEND COUNTY, TEXAS FOR **GULF COAST WATER AUTHORITY**

## GULF COAST WATER AUTHORITY BOARD OF DIRECTORS

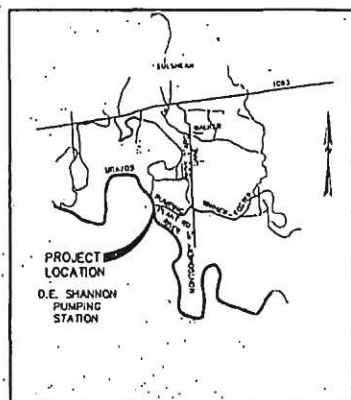
W. W. LATIMER, JR.	PRESIDENT
JAMES E. YARBROUCH	VICE PRESIDENT
JOHN W. KNUST	SECRETARY/TREASURER
CARLTON A. GETTY	ASST. SECRETARY/TREASURER
JOHN P. KLASS, JR.	DIRECTOR
JOSEPH C. TRAHAN	DIRECTOR
ROBERT C. WILLIAMS	DIRECTOR

## GULF COAST WATER AUTHORITY STAFF

GORDON L. MYERS	GENERAL MANAGER
DAVID A. SAUER	CANAL MANAGER
NANCY MATTHEWS	I. T. ADMINISTRATOR
ROBERT ISTRE	OPERATIONS MANAGER
BOB W. WEBB	BUSINESS ADMINISTRATOR
RAYMOND MACEK	MAINTENANCE AND OPERATIONS SUPERINTENDANT

## INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1 . . . . .	COVER SHEET
2 . . . . .	GENERAL NOTES
G-1 . . . . .	GRAVING PLAN
C-2 . . . . .	CONSTRUCTION CONTROL PLAN
G-3 . . . . .	MISCELLANEOUS DETAILS
S-1 . . . . .	STRUCTURAL PLAN AND SECTIONS
S-2 . . . . .	STRUCTURAL SECTIONS AND DETAILS
S-3 . . . . .	STRUCTURAL DETAILS
S-4 . . . . .	STRUCTURAL SECTIONS AND DETAILS



VICINITY MAP  
SCALE: 1" = 10 MILES

**PBS&**

APRIL, 2000  
ISSUED FOR CONSTRUCTION



**AS  
BUILT**



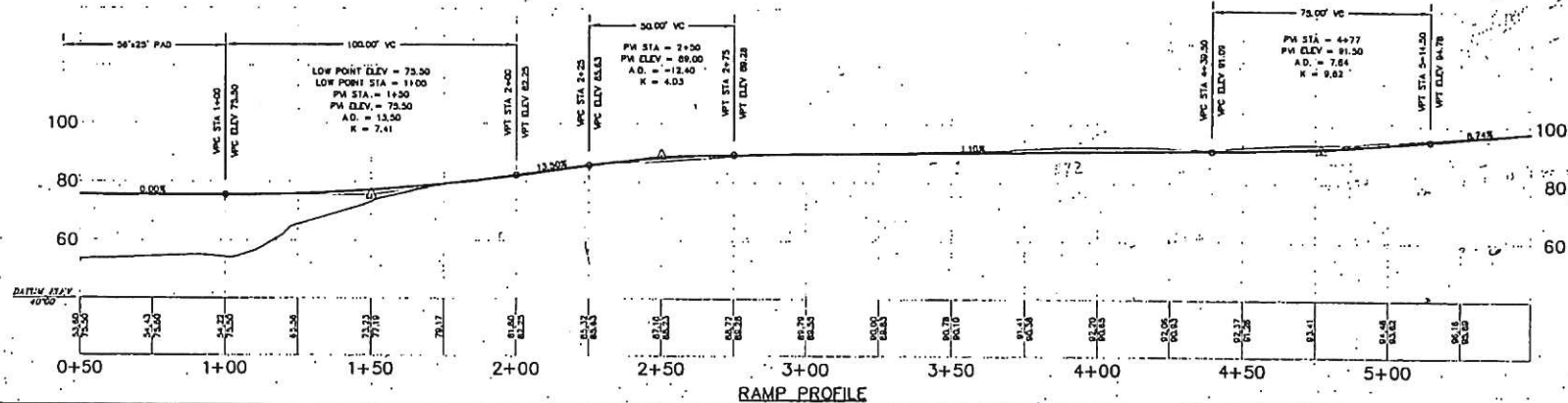
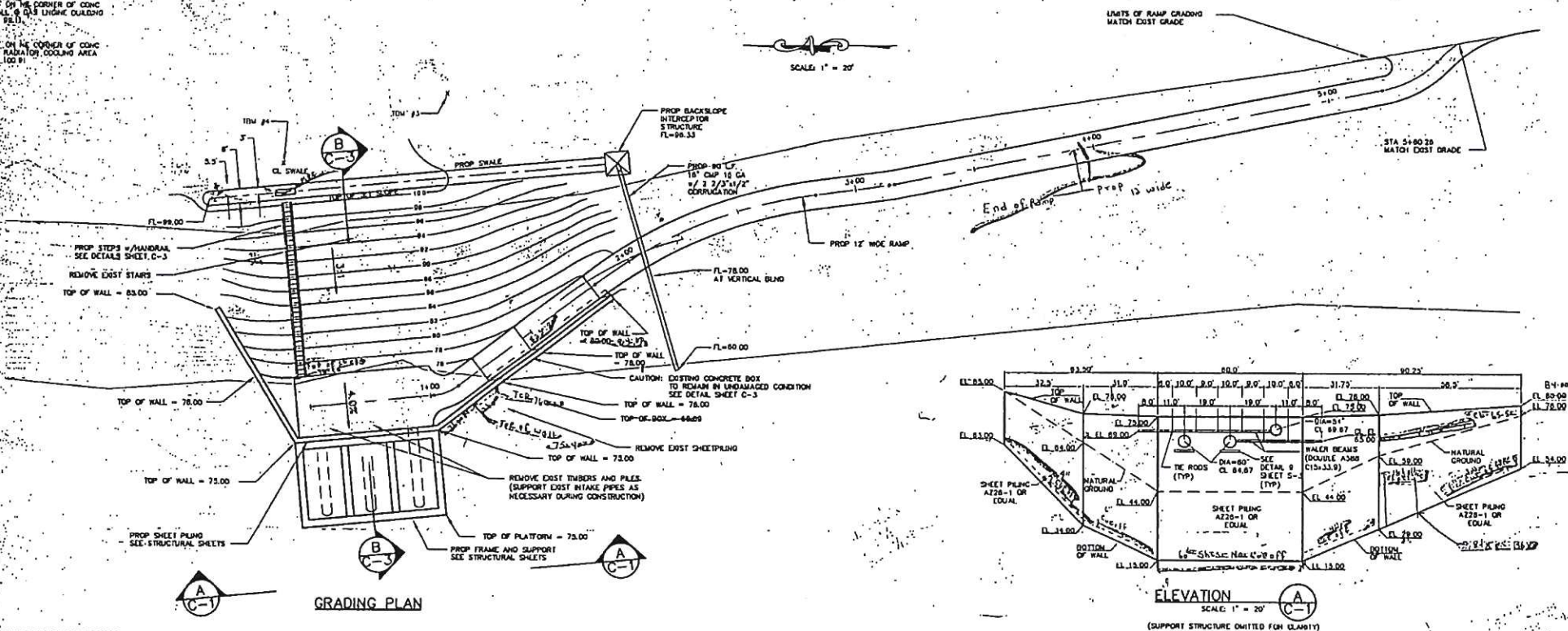




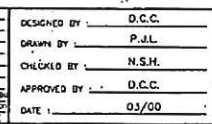
C.O.E. LETTER OF PERMISSION NO. \_\_\_\_\_  
FOR INTAKE STRUCTURE REPLACEMENT

C.O.E. NATIONWIDE PERMIT \_\_\_\_\_  
FOR BULKHEAD WITH ASSOCIATED FILL

G.L.D. EASEMENT NO. \_\_\_\_\_



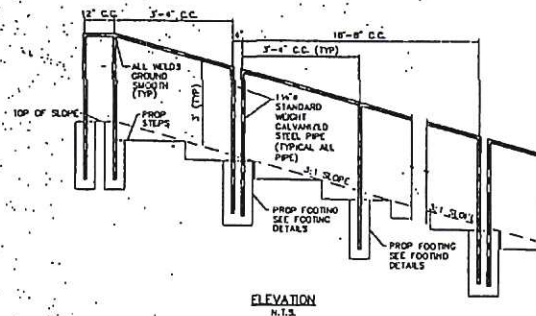
DESIGNED BY: D.C.C. DRAWN BY: P.J.L. CHECKED BY: N.S.H. APPROVED BY: D.C.C. DATE: 03/00		 3200 WILCREST, SUITE 200 HOUSTON, TEXAS 77042-6017 713-781-8800 M. McCongor N. Nish	D.E. SHANNON PUMPING STATION INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION SHEET NO. C-1 OF 9 SHEETS FILE NO. 460024.00
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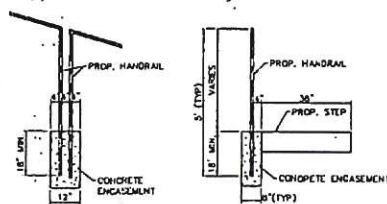
**D.E. SHANNON PUMPING STATION**  
**INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION**

SHEET NO. C-2  
OF 9 SHEETS  
FBI PM, 460024.00



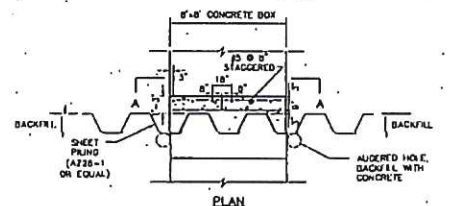


ELEVATION  
N.T.S.

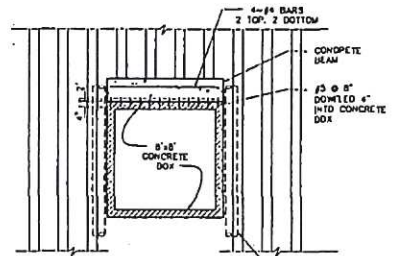


FOOTING DETAILS  
N.T.S.

HANDRAIL DETAILS  
N.T.S.



PLAN



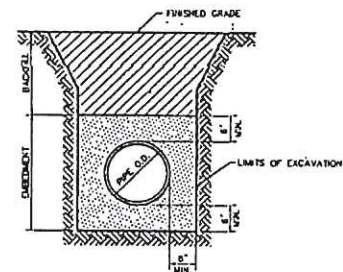
SECTION A-A

NOTE TO CONTRACTOR:

PROP TO INSTALLING SHEET PILING NEAR 8'-0\"/>

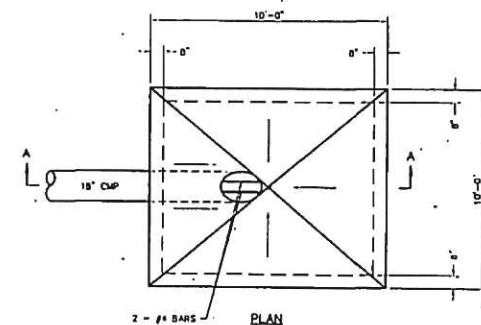
1. EXPOSE TOP OF 8'-0\"/>
2. INSTALL SHEET PILING USING THE FOLLOWING METHODOLOGY:  
 a. CUT SHEET PILING SO AS TO INSTALL SHEET PILING AS CLOSE TO ONE EDGE OF CONCRETE BOX AS POSSIBLE.  
 b. INSTALL SECTION OF SHEET PILING ABOVE CONCRETE BOX, BE SURE SHEET PILING IS RESTING ON TOP OF BOX AND THAT THE LAST SECTION EXTENDS PAST THE EDGE OF THE CONCRETE BOX. ATTACH AND INSTALL THE REMAINING SECTIONS OF SHEET PILING.
3. AFTER SHEET PILING IS INSTALLED AROUND CONCRETE BOX, USE AN AUGER TO FILL THE AREA BETWEEN BOTH SIDES OF CONCRETE BOX AND ASSOCIATED SHEET PILING. BE SURE TO EXTEND CONCRETE APPROXIMATELY 6\"/>
4. FORM CONCRETE BEAM ABOVE CONCRETE BOX, BE SURE BEAM IS IN CONTACT WITH SHEET PILING.

8'-0\"/>

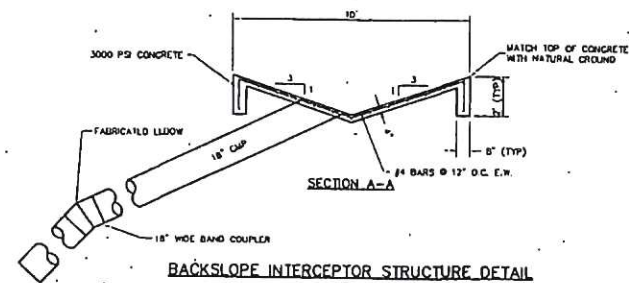


- NOTES:
1. BACKFILL SHALL BE SOIL MATERIAL AS SPECIFIED FOR FILL. USE NATIVE SOIL, FREE OF DEBRIS, PLACED IN 6\"/>
  2. FOR CULVERTS INSTALLED UNDER RAMP, CEMENT SHALL BE CEMENT STABILIZED SAND (1-1.5 BAGS PER CUBIC YARD) COMPACTED TO 95% STANDARD PROCTOR DENSITY IN FINISHED GRADE. IN OTHER AREAS, SEE NOTE 1.
  3. FRENCH DRAINING, IN ACCORDANCE WITH DSHA, SHALL BE INSTALLED WHERE REQUIRED.

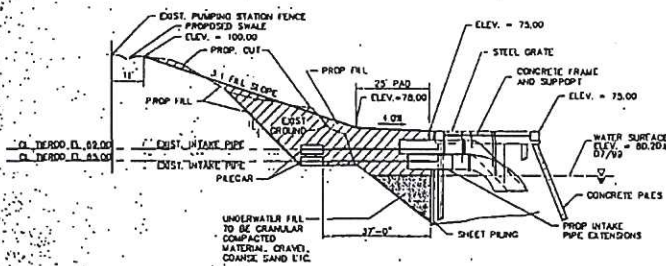
CULVERT BEDDING & BACKFILL  
N.T.S.



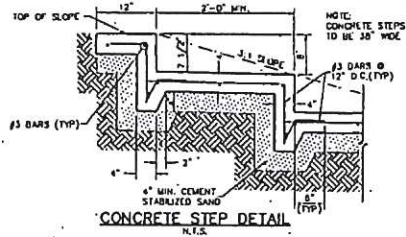
PLAN



BACKSLOPE INTERCEPTOR STRUCTURE DETAIL  
N.T.S.

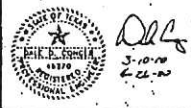


SECTION B  
SCALE: 1\"/>



CONCRETE STEP DETAIL  
N.T.S.

DESIGNED BY	D.C.C.
DRAWN BY	P.J.L.
CHECKED BY	H.S.H.
APPROVED BY	D.C.C.
DATE	03/00
REVISION	

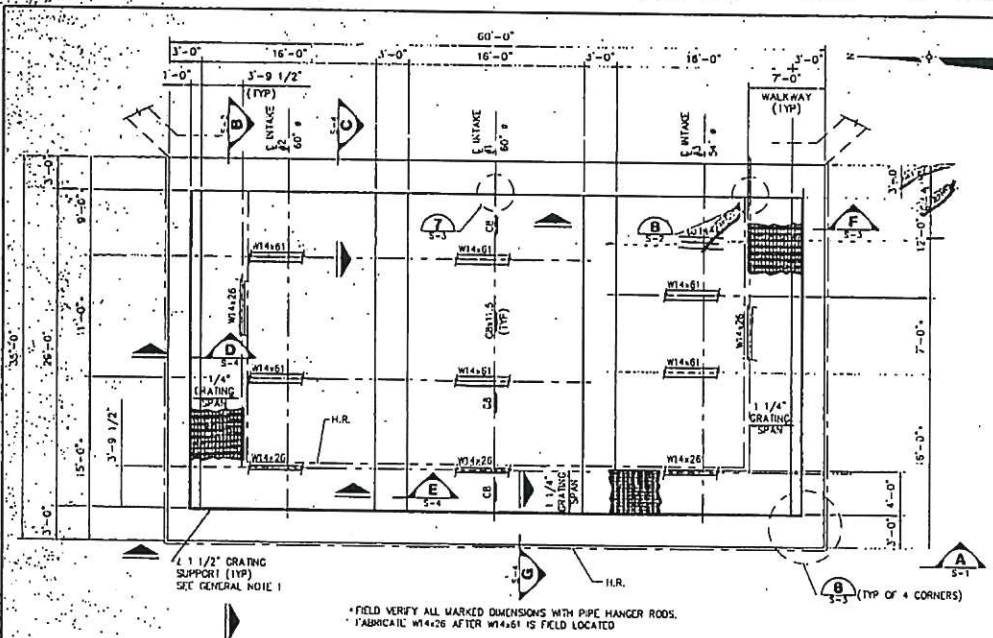


3200 WILCREST, SUITE 200  
HOUSTON, TEXAS 77042-6017  
713-781-5000

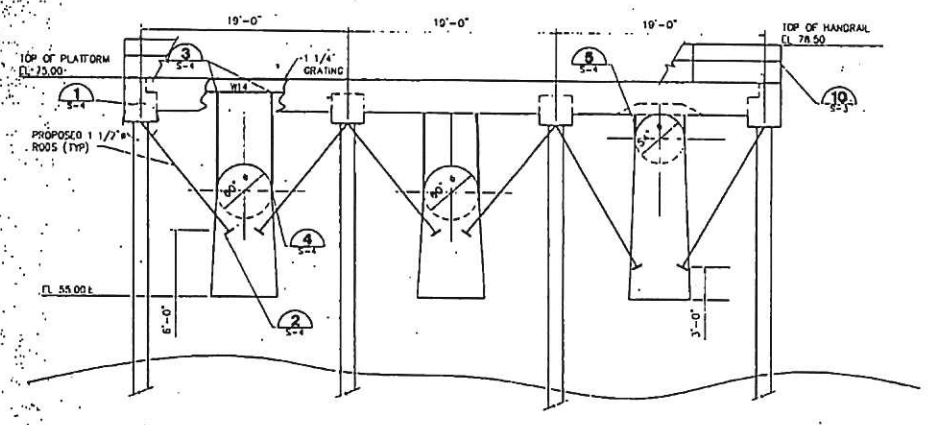
D.E. SHANNON PUMPING STATION  
INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION

MISCELLANEOUS DETAILS

SHEET NO. C-3  
OF 9 SHEETS  
PROJECT NO. 480024.00



PIPE SUPPORT STRUCTURE - PLAN  
3/16"=1'-0"

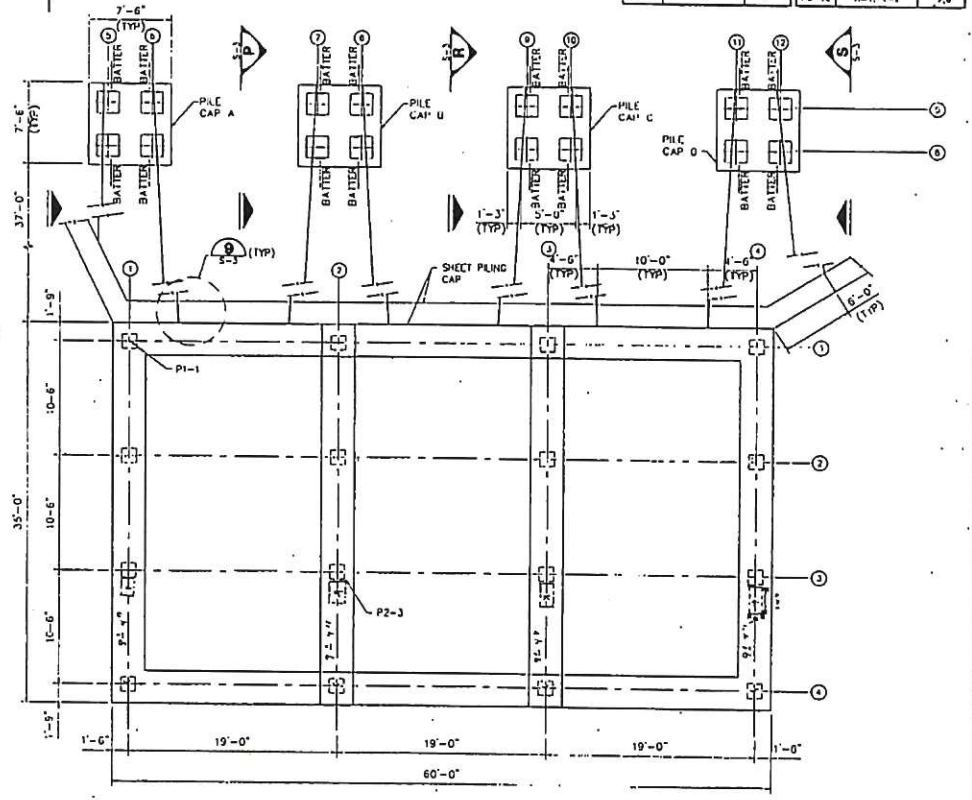


SECTION A-A  
3/16"=1'-0"

- GENERAL NOTES**
1. GRATING FASTENERS SHALL BE SADDLE CLIP ANCHORS SECURED TO THE SUPPORTING STEEL BY POWER DRIVEN STUDS. TWO FASTENERS PER PANEL SHALL BE USED AT EACH SUPPORT WITH A MINIMUM OF FOUR PER PANEL. THE CLIPS SHALL BE SUPPLIED BY THE GRATING FABRICATOR WITH 3X EXTRA TO COVER LOSSES. NO WELDING ALLOWED. ALL HARDWARE TO BE HEAVY HOT DIPPER GALVANIZED OR 304 STAINLESS STEEL.

- BATTERED PILE NOTES**
1. PROVIDE PILE MANUFACTURER'S STD. TENSION CONNECTION AT TOP OF PILE WITH 220 KIP CAPACITY FOR 24" SQ. PILES.
  2. BATTER DIRECTION AS SHOWN ON LAYOUT PLAN.
  3. BATTER DIRECTION DOWNSTREAM.
  4. PILES ARE 18" SQUARE, 60' LONG PRESTRESSED CONCRETE UNLESS NOTED OTHERWISE.
  5. SEE SHEET S-3 FOR THE BACK FOUNDATION DETAILS.
  6. PILES ARE 24" SQUARE, 60' LONG PRESTRESSED CONCRETE UNLESS NOTED OTHERWISE.

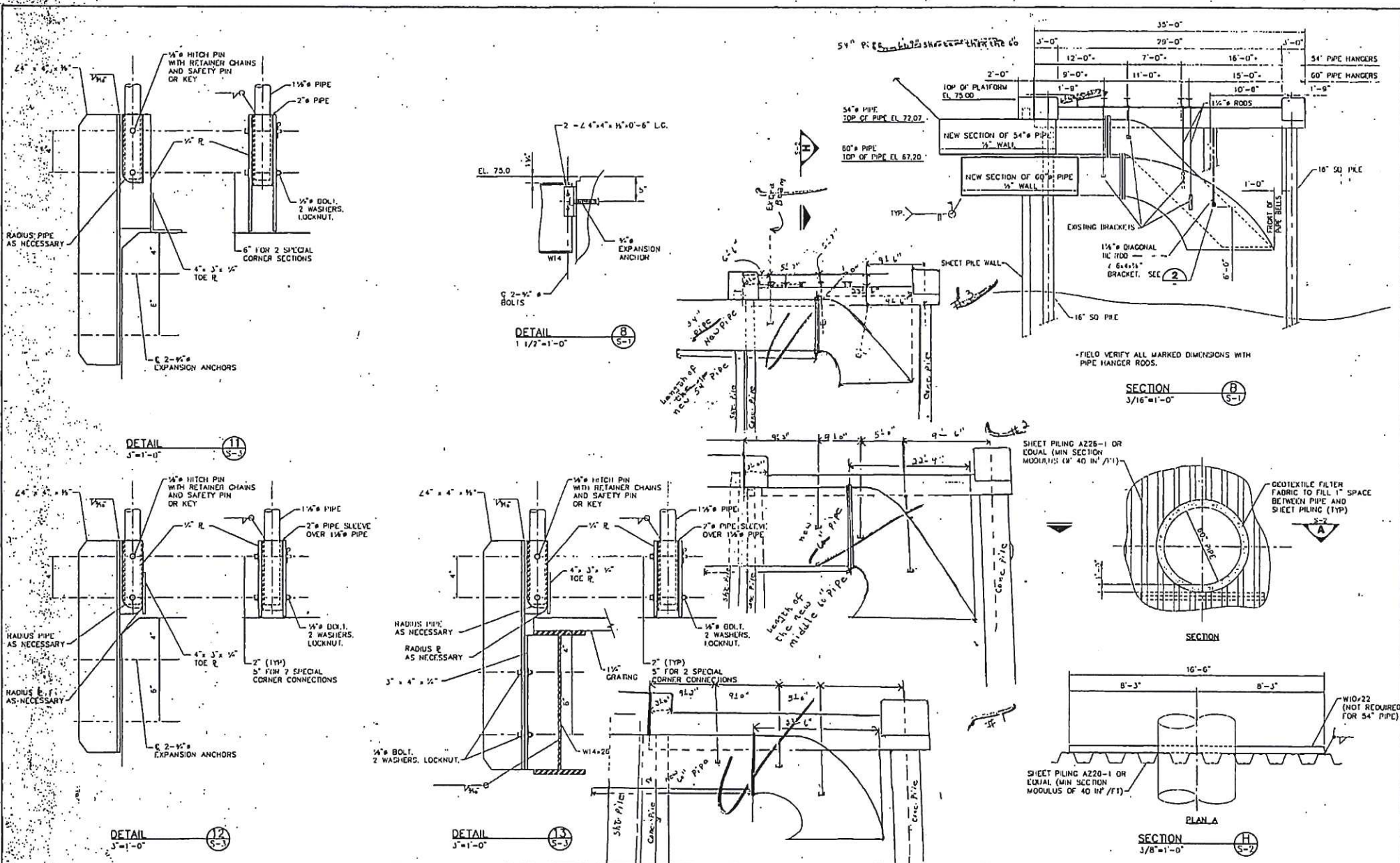
PILE SCHEDULE			BATTERED PILE SCHEDULE		
PILE MARK	BATTER	NOTES	PILE MARK	BATTER	NOTES
P1-1	-	4	P3-5	H=1, V=2	1,2,6
P1-2	-	4	P3-6	H=1, V=2	1,2,6
P1-3	-	4	P3-7	H=1, V=2	1,2,6
P1-4	-	4	P3-8	H=1, V=2	1,2,6
P2-1	-	4	P3-9	H=1, V=2	1,2,6
P2-2	-	4	P3-10	H=1, V=2	1,2,6
P2-3	-	4	P3-11	H=1, V=2	1,2,6
P2-4	-	4	P3-12	H=1, V=2	1,2,6
P3-1	-	4	P6-5	H=1, V=2	2,6
P3-2	-	4	P6-6	H=1, V=2	2,6
P3-3	-	4	P6-7	H=1, V=2	2,6
P3-4	-	4	P6-8	H=1, V=2	2,6
P4-1	-	4	P6-9	H=1, V=2	2,6
P4-2	-	4	P6-10	H=1, V=2	2,6
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P4-4	-	4	P6-12	H=1, V=2	2,6



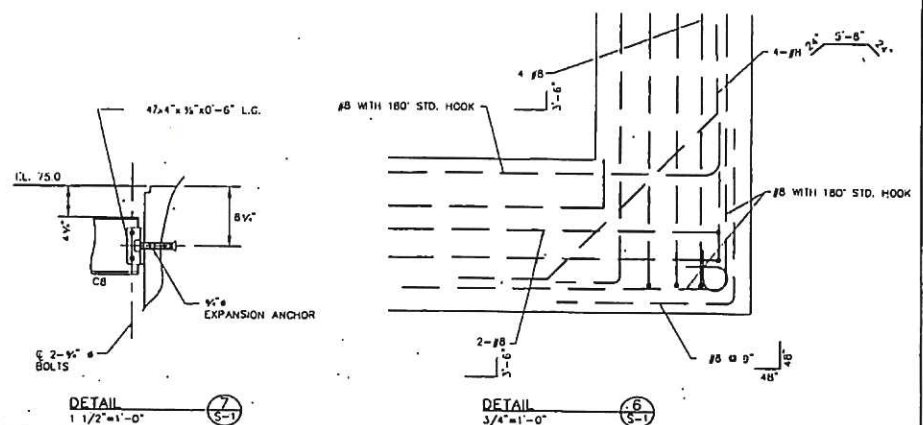
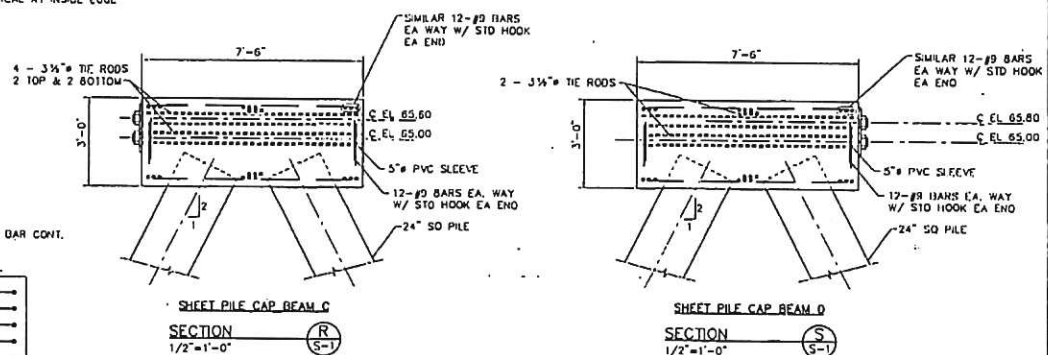
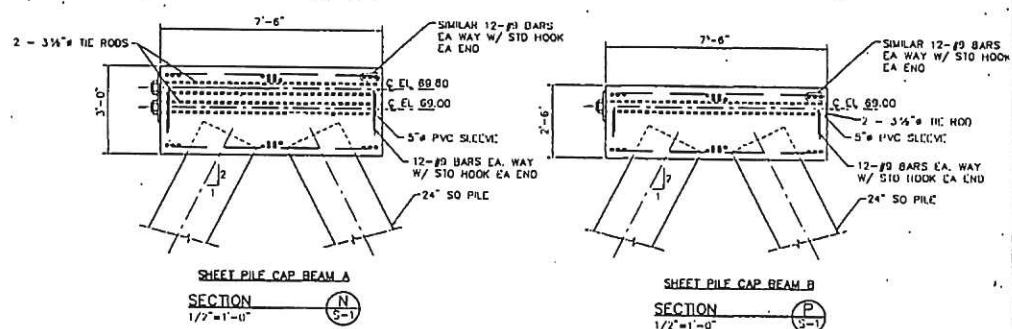
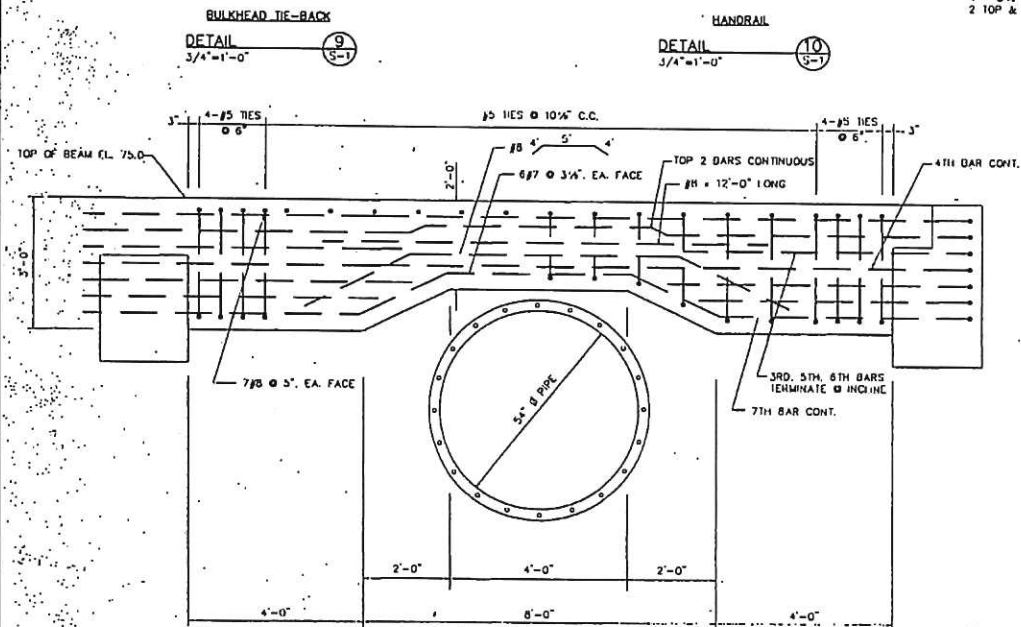
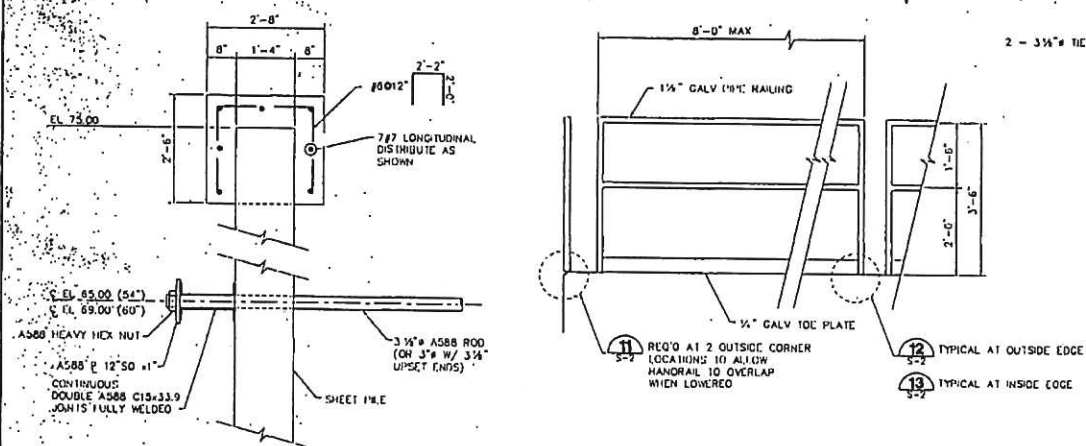
WALKWAY AND PILING LAYOUT - PLAN  
3/16"=1'-0"

DESIGNED BY: O.C.C. DRAWN BY: P.J.L. CHECKED BY: N.S.H. APPROVED BY: O.C.C. DATE: 03/00			<b>PBS&amp;J</b> 3700 WILCREST, SUITE 200 HOUSTON, TEXAS 77042-0017 713-781-8800	D.E. SHANNON PUMPING STATION INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION <b>STRUCTURAL PLAN AND SECTIONS</b>	SHEET NO. S-1 OF 9 SHEETS FILE NO. 460024.00
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DESIGNED BY: D.C.C. DRAWN BY: P.J.L. CHECKED BY: N.S.H. APPROVED BY: D.C.C. DATE: 03/00	3200 WILCREST, SUITE 200 HOUSTON, TEXAS 77042-0017 713-781-6000	D.E. SHANNON PUMPING STATION INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION STRUCTURAL SECTIONS AND DETAILS	SHEET NO. S-2 OF 9 SHEETS FILE NO. 460024.00
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SECTION 3/4"=1'-0" (F)

DETAIL 1 1/2"=1'-0" (7)

DETAIL 3/4"=1'-0" (6)

DESIGNED BY	D.C.C.
DRAWN BY	P.J.L.
CHECKED BY	N.S.H.
APPROVED BY	D.C.C.
DATE	03/00
BY	DATE



**PBS&I**

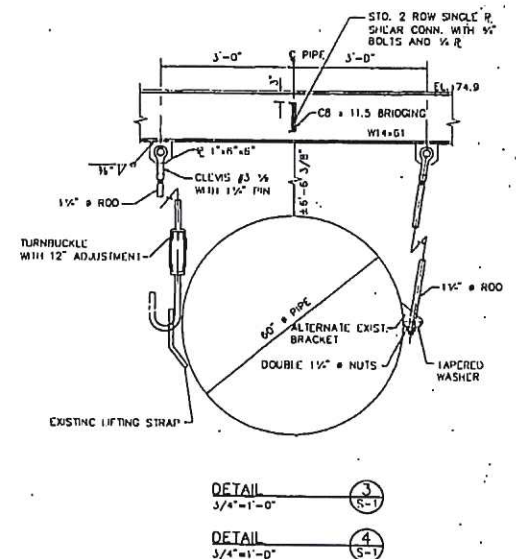
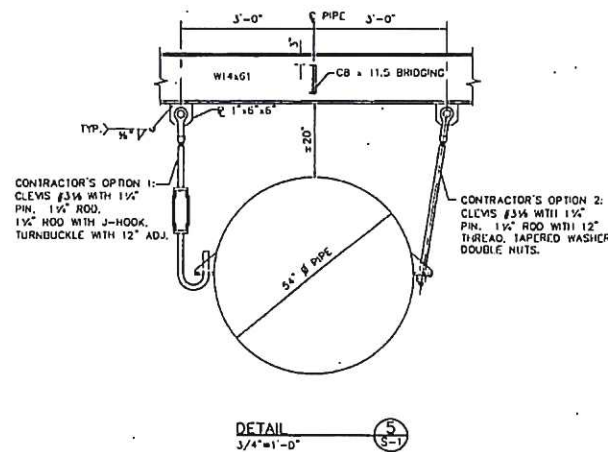
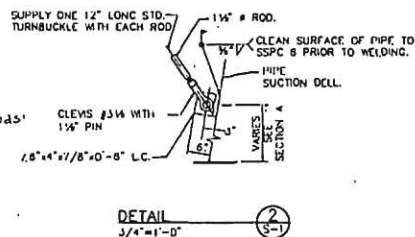
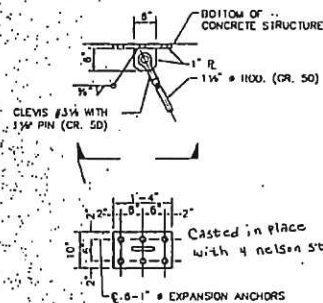
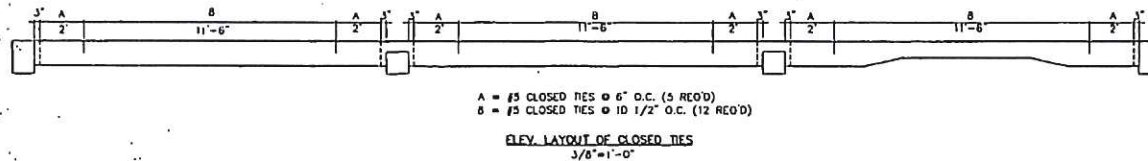
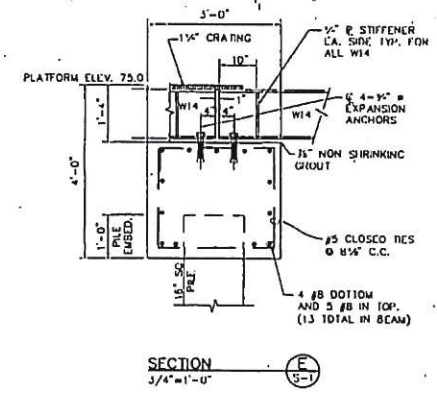
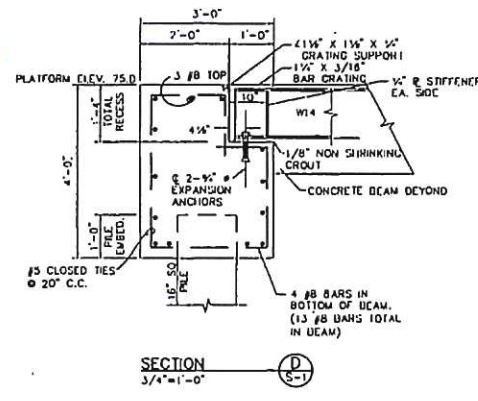
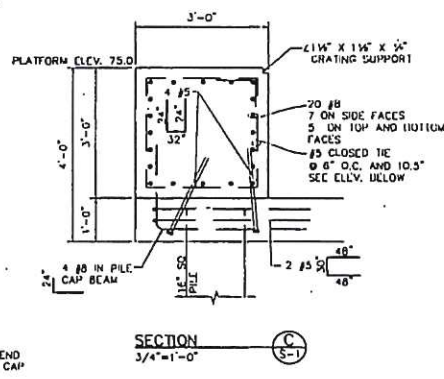
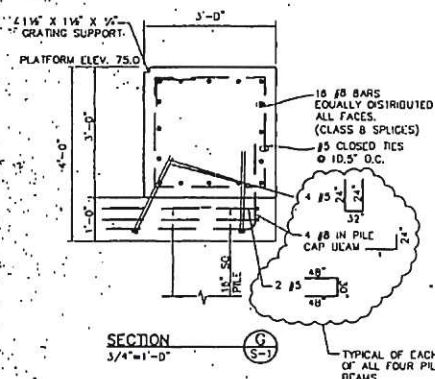
3200 WILCREST, SUITE 200  
HOUSTON, TEXAS 77042-6017  
713-781-8000

D.E. SHANNON PUMPING STATION  
INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION

STRUCTURAL DETAILS

SHEET NO. S-3  
OF 9 SHEETS  
FILE NO. 460024.00





DESIGNED BY	D.C.C.
DRAWN BY	P.J.L.
CHECKED BY	N.S.H.
APPROVED BY	D.C.C.
DATE	03/00
BY	DATE



3200 WILCREST, SUITE 200  
HOUSTON, TEXAS 77042-0017  
713-781-8800

D.E. SHANNON PUMPING STATION  
INTAKE PIPE SUPPORT STRUCTURE AND SLOPE REHABILITATION

STRUCTURAL SECTIONS AND DETAILS

SHEET NO. S-4  
OF 9 SHEETS  
FILE NO. 460024.00

RETURNED AT COUNTER TO:

Matthew

GULF COAST WATER AUTHORITY  
3630 Hwy. 1765  
TEXAS CITY, TEXAS 77591

FILED AND RECORDED

OFFICIAL PUBLIC RECORDS

*Dianne Wilson*

2011 Nov 15 09:42 AM

CDC \$127.00

2011114499

Dianne Wilson COUNTY CLERK

FT BEND COUNTY TEXAS



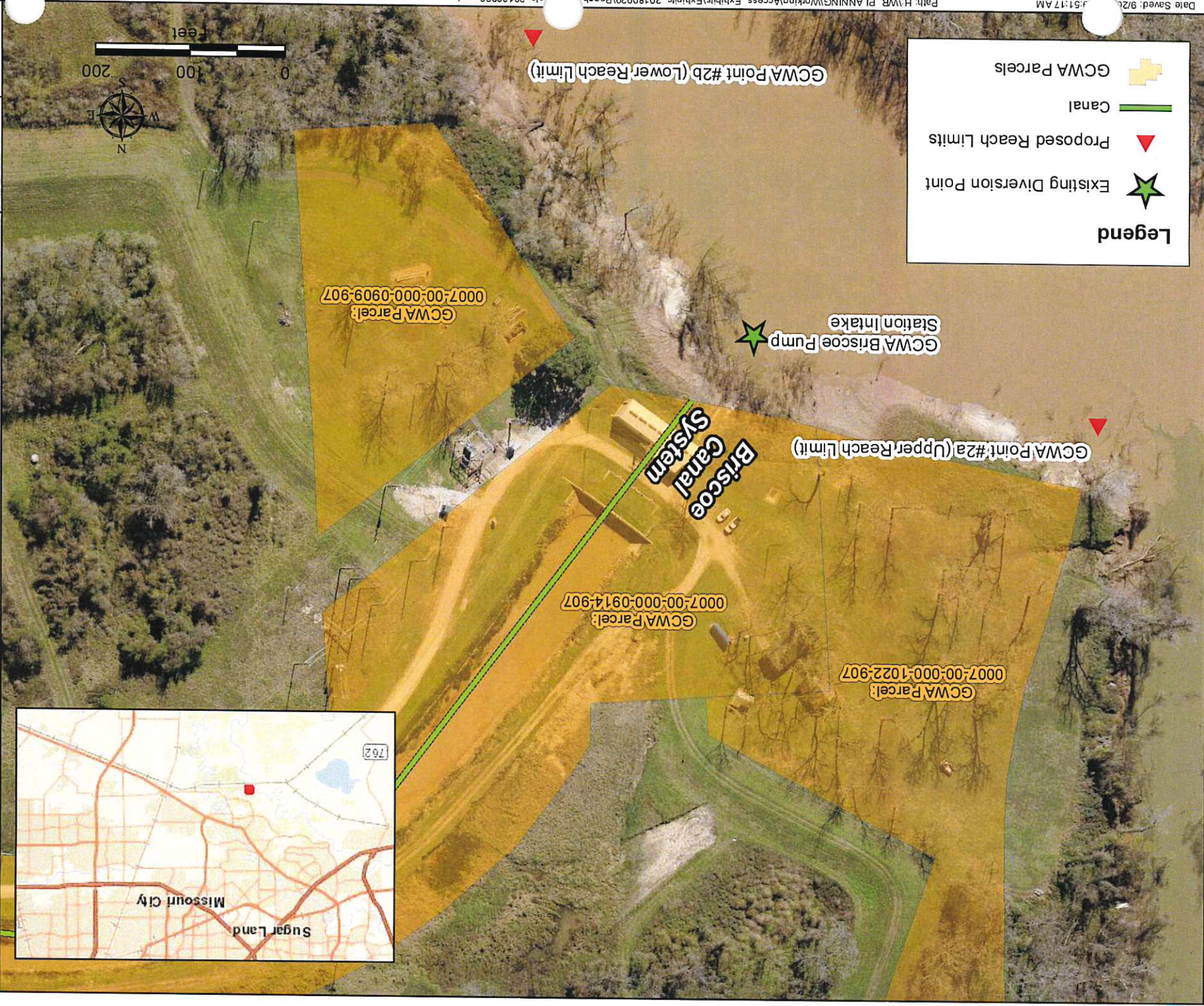
## **Attachment 5-2:**

Deed and Easement Information for GCWA Reach 2  
(Briscoe Pump Station and Briscoe Canal)



**Legend**

-  GCWA Parcels
-  Canal
-  Proposed Reach Limits
-  Existing Diversion Point



**FIGURE A5-2**

**FREESE NICHOLS**  
FREESE AND NICHOLS, INC.  
10097 TOWN AND COUNTRY WAY  
SUITE 600  
HOUSTON, TEXAS 77024  
OFFICE: 713-600-6800  
FAX: 713-600-6303

**GULF COAST WATER AUTHORITY**  
**Proposed Water Right Amendment**  
**Briscoe Canal Reach**

**PROJECT INFORMATION**

DATE CREATED	09/26/2017
DRAWN & COORDINATE SYSTEM	DAW 8207201
FILE NAME	MOISTURE MAP FOR TOWN AND COUNTRY CANAL
PROJECT NUMBER	10097 TOWN AND COUNTRY CANAL



**Document 5-2(a)**

2000 Warranty Deed

PARTNERS TITLE COMPANY  
5851 San Felipe, Suite 150  
Houston, TX 77057-8010

99204268 JH

**SPECIAL WARRANTY DEED**

THE STATE OF TEXAS §  
§  
COUNTY OF FORT BEND §

KNOW ALL MEN BY THESE PRESENTS:

THAT PARIS R. SCHINDLER, TRUSTEE and DEWALT LAND LIMITED, a Texas limited partnership, acting through Dewalt Management Co., a Texas corporation, its general partner, (the "Grantor"), for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has GRANTED, BARGAINED, SOLD, and CONVEYED and by these presents does GRANT, BARGAIN, SELL, AND CONVEY unto GULF COAST WATER AUTHORITY (the "Grantee") that certain tract or parcel of land in Fort Bend County, Texas more particularly described in **Exhibit "A"** attached hereto and incorporated herein by this reference (the "Land"), together with all rights, titles, and interests appurtenant thereto, and any improvements situated thereon, if any, as well as the rights and interests of Grantor under that certain Warranty Deed from Joseph W. Taylor to Houston Lighting & Power Company, recorded in Book 471, Page 190 of the Deed Records of Fort Bend County, Texas affecting the 11.55-acre tract described on pages 4, 5 and 6 of **Exhibit "A"** attached hereto (such Land, improvements, and interests are hereinafter collectively referred to as the "Property"), SAVE, LESS and EXCEPT, and Grantor reserves to itself, certain reserved rights set forth herein.

This Special Warranty Deed and the conveyance herein set forth is made by Grantor and accepted by Grantee subject to the reservations herein and the matters described in **Exhibit "B"** attached hereto and incorporated herein by this reference, but only to the extent the same are validly existing and applicable to the Property (hereinafter referred to collectively as the "Permitted Encumbrances").

Grantor hereby reserves and retains an easement across the Property (leading directly to and from and including the three existing bridges across Grantee's water canal) for pedestrian and vehicular ingress and egress to the tract of land described more particularly in **Exhibit "C"** hereto (herein, the "Taylor/Fenn Tract"), for agricultural, personal, and recreational use only (the "Family Easement"). Reasonable load limits for vehicular ingress and egress may be established from time to time by Grantee. **GRANTOR HAS THE RIGHT TO USE THE FAMILY EASEMENT AND THE BRIDGES "AS IS," AND GRANTOR ASSUMES ALL RISK, WITHOUT LIABILITY TO GRANTEE, AND WITHOUT ANY MAINTENANCE, REPAIR, OR OTHER OBLIGATIONS ON THE PART OF GRANTEE. GRANTOR IS RESPONSIBLE AND LIABLE FOR ALL DAMAGES TO THE PROPERTY, FACILITIES AND IMPROVEMENTS OF GRANTEE RESULTING FROM THE USE OF THE FAMILY EASEMENT. THE PARTIES EXPRESSLY INTEND AND AGREE THAT THE PRECEDING TWO SENTENCES SHALL APPLY EVEN IN THE EVENT OF GRANTEE'S NEGLIGENCE (BUT NOT GROSS NEGLIGENCE OR WILLFUL MISCONDUCT).** The Family Easement is for the benefit of the Taylor/Fenn Tract for so long as and only as long as the



Taylor/Fenn Tract is owned by the descendants of Raymond Schindler, either directly or through DeWalt Land Limited or Fort Bend Improvement Ltd. If the Taylor/Fenn Tract ceases to be owned by the descendants of Raymond Schindler either directly or through DeWalt Land Limited or Fort Bend Improvement, Ltd., then the Family Easement shall automatically terminate. Grantee may, in its sole discretion, from time to time change the location of, and eliminate or remove, roads and bridges and the Family Easement shall automatically be changed accordingly.

Grantor hereby reserves and retains all of the oil, gas and other minerals of every kind and nature that are in and under the Property (all of such oil, gas and other minerals being herein collectively referred to as the "Minerals"); and such Minerals reserved and retained are and shall be burdened by all prior mineral and royalty reservations. Notwithstanding anything herein to the contrary, Grantor hereby expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon or to use the surface of the Property or any part thereof, to a depth of five hundred (500) feet, including, without limitation, the right to enter upon the surface of the Property for purposes of exploring for, developing, drilling, producing, transporting, mining, treating, storing or any other purposes incident to the exploitation of the oil, gas and other minerals in, on, and under the Property. However, nothing herein contained shall ever be construed to prevent the Grantor, its successors and assigns, from developing or producing the oil, gas and other minerals in and under the Property by pooling or by directional drilling under the Property from well sites located on tracts other than the Property, provided that all such activities on the Property are at least five hundred (500) feet below the surface.

Grantee hereby agrees that there shall not be prorated and Grantee shall be solely responsible for any subsequent tax assessments of any type for prior years due to change in land usage or ownership, including without limitation any taxes imposed under Sections 23.55 and 23.76 of the Property Tax Code of the State of Texas pertaining to land previously appraised for usage as timber land or agricultural land. Except for so-called "roll-back" taxes as provided above, Grantor shall be responsible for all taxes with respect to the Property for the period of time to the date hereof. Grantor shall be responsible for all taxes (including so-called "roll-back" taxes) with respect to the Family Easement and Minerals.


Grantor shall have no liability for any impact fees of Fort Bend County which result from this conveyance or Grantee's use or ownership of the Property. All such fees, if applicable, shall be paid by the Grantee.

TO HAVE AND TO HOLD the Property, together with all and singular the rights and appurtenances thereunto in anywise belonging, unto Grantee, its successors and assigns forever, and Grantor does hereby bind itself, its successors and assigns, to WARRANT AND FOREVER DEFEND, all and singular the title to the Property unto the said Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Grantor, but not otherwise, subject only to the reservations herein and the Permitted Encumbrances.

Grantor's reserved rights with respect to the Family Easement and Minerals shall be subject and subordinate to, and shall not be exercised in a manner that interferes with, Grantee's use and enjoyment of the Property, and Grantee's water canal, land and related facilities.

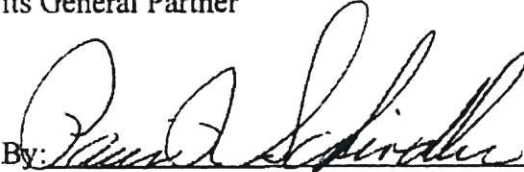
The provisions hereof shall be binding upon, and inure to the benefit of, the parties hereto and their respective successors and assigns.

Grantee's address is: Gulf Coast Water Authority, attention Gordon L. Myers,  
3630 Highway 1765, Texas City, Texas 77591.

By:   
PARIS R. SCHINDLER, TRUSTEE

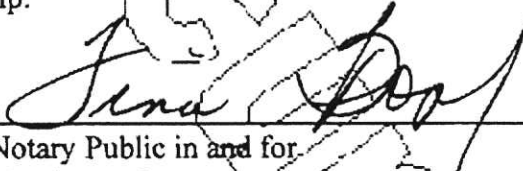
DEWALT LAND LIMITED, a Texas limited  
partnership

By: DEWALT MANAGEMENT CO.,  
its General Partner

By:   
Paris R. Schindler, President

STATE OF TEXAS       §  
                                  §  
COUNTY OF HARRIS   §

This instrument was acknowledged before me on February 4, 2000, by Paris R. Schindler, as Trustee and as President of Dewalt Management Co., a Texas corporation which is the sole general partner of Dewalt Land Limited, a Texas limited partnership, on behalf of said family partnership, corporation and limited partnership.

  
Notary Public in and for  
The State of Texas

(SEAL)

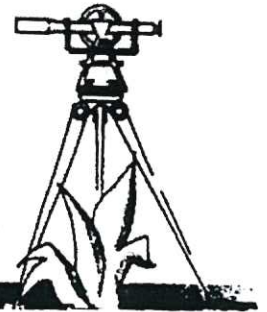




# EXHIBIT A

ADAMS SURVEYING CO.  
STEVE D. ADAMS  
Registered Professional Land Surveyor  
PHONE: (713) 331-3523

215 W. Seely St.  
MAIL P.O. BOX 114  
ALVIN, TEXAS 77512-0114



## FIELD NOTES

98.60 ACRES GROSS (87.05 ACRES NET), BEING A PART OF THE THOMAS BARNETT LEAGUE, ABSTRACT 7, FORT BEND COUNTY, TEXAS, BEING A PART OF THAT CERTAIN CALLED 279.926 ACRE TRACT DESCRIBED AS PART ONE IN A DEED TO DEWALT LAND, LTD. RECORDED IN FILE NO. 9781306, FORT BEND COUNTY OFFICIAL RECORDS, A PART OF THAT CERTAIN 214.69 ACRE TRACT DESCRIBED IN VOLUME 505, PAGE 602, FORT BEND COUNTY DEED RECORDS, AND BEING ALL OF THAT CERTAIN TRACT DESCRIBED AS FIRST TRACT AND TRACT "A" IN AN INSTRUMENT RECORDED IN VOLUME 194, PAGE 86, DEED RECORDS, AND A PART OF THAT CERTAIN TRACT DESCRIBED AS A 200.0 FOOT CANAL EASEMENT RECORDED IN VOLUME 200, PAGE 236, DEED RECORDS, SAID 98.60 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1-1/2 inch iron pipe found at the Southeast corner of a 93.52 acre tract described in a deed to John S. Dunn Research Foundation recorded in Volume 1596, Page 22, Official Records, said point being at the intersection of the North line of the aforementioned 200.0 foot Canal Easement with the Southwest right-of-way line of Sienna Parkway (140.0 feet wide in Volume 2030, Page 958, Official Records);

THENCE along the West-right-of-way line of Sienna Parkway, following a curve to the right having a Radius of 1930.04 feet, Central Angle of 45 deg. 45 min. 02 sec., Chord Bearing and Distance South 18 deg. 03 min. 17 sec. East - 294.48 feet, at 211.98 feet pass the South line of the aforementioned 200.0 foot Canal Easement, and continue for a total arc distance of 294.77 feet to a 1 inch iron pipe with an aluminum cap set for the upper Southeast corner of the herein described tract;

THENCE South 89 deg. 59 min. 21 sec. West, parallel to the South line of the Dunn tract and being 80.0 feet at right angles from the South line of said Canal Easement, a distance of 1631.75 feet to a 1 inch iron pipe with an aluminum cap set at the P.C. of a curve to the left;

THENCE in a Southwesterly direction, along a line 80.0 feet distant from said Canal Easement, following said curve to the left having a Radius of 1142.5 feet, Central Angle of 41 deg. 31 min. 53 sec., Chord Bearing and Distance South 69 deg. 13 min. 24 sec. West - 866.87 feet, for an arc distance of 886.14 feet to a 1 inch iron pipe with an aluminum cap set at the P.T. of said curve;

THENCE South 48 deg. 27 min. 28 sec. West, along a line 80.0 feet at right angles from said Canal Easement, at 1299.51 feet pass a 1/2 inch iron pipe found at the Northeast corner of a called 11.734 acre tract described in a deed to H.L.S. recorded in Volume 471, Page 190, Deed Records, and continue

AS PER ORIGINAL



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ADAMS SURVEYING CO.  
STEVE D. ADAMS  
Registered Professional Land Surveyor  
PHONE: (713) 331-3523

215 W. Sealy St.  
MAIL: P.O. BOX 114  
ALVIN, TEXAS 77512-0114

2018-0100

Page 2 of Field Notes on 98.60 acres of land

along the Southeast line of said H.L. & P. tract, for a total distance of 3094.55 feet to a 3/4 inch iron rod found for corner;

THENCE South 81 deg. 13 min. 35 sec. West, along the South line of said H.L. & P. tract, a distance of 218.79 feet to a 1 inch iron pipe with an aluminum cap set for corner in the East line of a 10.789 acre tract described in Volume 2301, Page 687, Official Records;

THENCE South 00 deg. 03 min. West, along the East line of said 10.789 acre tract, a distance of 278.63 feet to a 1 inch iron pipe with an aluminum cap set in the South line of the aforementioned 279.926 acre tract and the North line of the Sienna Plantation, LTD. tract recorded in Volume 951, Page 578, Deed Records;

THENCE North 89 deg. 57 min. West, along the South line of said 279.926 acre tract and the North line of the Sienna tract, at 3234.19 feet pass a concrete monument found, and continue for a total distance of 3376.78 feet to the Southwest corner of the herein described tract on the Easterly High Bank of the Brazos River;

THENCE up the Easterly High Bank of the Brazos River the following courses and distances:

- North 23 deg. 18 min. West - 150.43 feet,
- North 32 deg. 51 min. West - 162.54 feet,
- North 50 deg. 04 min. West - 169.16 feet, and
- North 79 deg. 54 min. 25 sec. West - 110.50 feet

to a 3/4 inch iron pipe found at the Southwest corner of the aforementioned First Tract described in Volume 194, Page 86, Deed Records, said point also being the lower Southeast corner of a 36.0 acre tract conveyed to Gulf Coast Water Authority in Volume 2301, Page 674, Official Records;

THENCE North 00 deg. 08 min. East, along the West line of said First Tract and a line of said 36.0 acre tract, a distance of 245.36 feet to a 3/4 inch iron pipe found for corner;

THENCE South 89 deg. 41 min. East, along the North line of said First Tract and a line of said 36.0 acre tract at 160.36 feet pass a 3/4 inch iron pipe found, and continue for a total distance of 253.75 feet to a point for corner, being a corner of said 36.0 acre tract;

THENCE following a curve to the right, along the South line of said 36.0 acre tract, having a Radius of 673.0 feet Central Angle of 62 deg. 22 min. 24 sec., Chord Bearing and Distance of North 62 deg. 03 min. 21 sec. East - 697.0 feet

AS PER ORIGINAL

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ADAMS SURVEYING CO.  
STEVE D. ADAMS  
Registered Professional Land Surveyor  
PHONE: (713) 331-3523

215 W. Sealy St.  
MAIL: P.O. BOX 114  
ALVIN, TEXAS 77512-0114

Page 3 of Field Notes on 98.60 acres of land

for an arc distance of 732.64 feet to a 1 inch iron pipe with an aluminum cap set at the P.T. of said curve;

THENCE South 79 deg. 44 min. East, along the South line of said 36.0 acre tract, a distance of 842.80 feet to a 2 inch iron pipe found at the Southeast corner of said tract in the West line of a 1114.825 acre tract surveyed 1/12/98 by Costello, Inc.;

THENCE South 01 deg. 41 min. 13 sec. East, along the West line of said 1114.825 acre tract, a distance of 3.26 feet to a 5/8 inch iron rod set for corner;

THENCE South 79 deg. 40 min. 02 sec. East, along the South line of said 1114.825 acre tract, a distance of 1535.75 feet to a 5/8 inch iron rod set at the P.C. of a curve to the left;

THENCE following said curve to the left having a Radius of 1046.0 feet, Central Angle of 31 deg. 31 min. 25 sec., Chord Bearing and Distance of North 84 deg. 34 min. 15 sec. East - 568.77 feet for an arc distance of 575.50 feet to a 5/8 inch iron rod set at the P.C. of said curve;

THENCE North 68 deg. 37 min. 40 sec. East, along the South line of said 1114.825 acre tract, a distance of 114.07 feet to a 5/8 inch iron rod set for angle point;

THENCE North 59 deg. 51 min. 51 sec. East, along the South line of said 1114.825 acre tract, a distance of 160.88 feet to a 5/8 inch iron set for angle point;

THENCE North 48 deg. 27 min. 28 sec. East a distance of 2790.37 feet to a 1 inch iron pipe with an aluminum cap set at the P.C. of a curve to the right;

THENCE following said curve to the right having a Radius of 1422.5 feet, Central Angle of 41 deg. 31 min. 53 sec., Chord Bearing and Distance of North 69 deg. 13 min. 24 sec. East - 1008.69 feet for an arc distance of 1032.11 feet to a 1 inch iron pipe with an aluminum cap set at the P.T. of said curve in the South line of the Dunn tract and the North line of the aforementioned 200.0 foot Canal Easement;

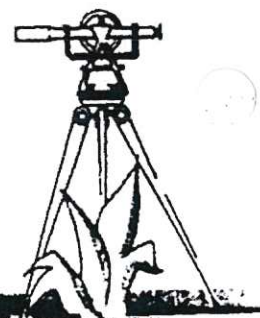
THENCE North 89 deg. 59 min. 21 sec. East, along the South line of the Dunn tract and the North line of said Canal Easement, a distance of 1540.54 feet to the PLACE OF BEGINNING and containing 98.60 acres of land, LESS AND EXCEPT THE FOLLOWING DESCRIBED TRACT.

AS PER ORIGINAL



ADAMS SURVEYING CO.  
STEVE D. ADAMS  
Registered Professional Land Surveyor  
PHONE: (713) 331-3523

215 W. Sealy St.  
MAIL P.O. BOX 114  
ALVIN TEXAS 77512-0114



Page 5 of Field Notes on 98.60 acres of land

THENCE North 79 deg. 40 min. 02 sec. West, along the South line of said 11.734 acre tract, a distance of 2573.79 feet to a 1/2 inch iron pipe found for angle point;

THENCE South 54 deg. 14 min. 40 sec. West, along the South line of said 11.734 acre tract, at 441.76 feet pass a 1/2 inch iron pipe found, and continue for a total distance of 764.67 feet to a point for corner on the Easterly high bank of the Brazos River;

THENCE up the Easterly bank of the Brazos River the following courses and distances:

North 32 deg. 51 min. West - 46.02 feet and

North 50 deg. 04 min. West - 35.14 feet  
to a point for corner;

THENCE North 54 deg. 14 min. 40 sec. East, along the North line of said 11.734 acre tract, a distance of 417.89 feet to a point for corner in the East line of a called 5.0 acre tract described as First Tract in a deed recorded in Volume 194, Page 86. Deed Records;

THENCE North 00 deg. 03 min. East, along the East line of said 5.0 acre tract, a distance of 103.54 feet to a 1/2 inch iron rod found at the Northeast corner of said 5.0 acre tract;

THENCE North 89 deg. 41 min. West, along the North line of said 5.0 acre tract, a distance of 46.72 feet to a point for corner;

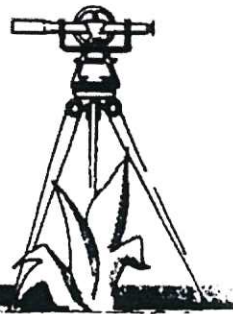
THENCE along the South line of a 200.0 foot Canal Easement described in Volume 194, Page 91, Deed Records, following a curve to the right having a Radius of 473.0 feet, Chord Bearing and Distance of North 68 deg. 46 min. East - 355.42 feet, for an arc distance of 364.36 feet to a 1/2 inch iron rod set for corner;

THENCE South 79 deg. 40 min. 02 sec. East, along the South line of said Canal Easement and the North line of said 11.734 acre tract, a distance of 2377.58 feet to a 1/2 inch iron rod set at the P.C. of a curve to the left;

THENCE following said curve to the left having a Radius of 1246.0 feet, Chord Bearing and Distance of North 84 deg. 34 min. 15 sec. East - 672.92 feet, for an arc distance of 685.54 feet to a 1/2 inch iron rod found at the P.T. of said curve;

THENCE North 68 deg. 29 min. 24 sec. East, along the South line of said Canal Easement and the North line of said 11.734

AS PER ORIGINAL



ADAMS SURVEYING CO.  
STEVE D. ADAMS  
Registered Professional Land Surveyor  
PHONE: (713) 331-3523

215 W. Sealy St  
MAIL P.O. BOX 114  
ALVIN, TEXAS 77512-0114

Page 6 of Field Notes on 98.60 acres of land

acre tract, a distance of 130.53 feet to a 1/2 inch iron pipe found for angle point;

THENCE North 59 deg. 56 min. 49 sec. East, along the South line of said Canal Easement and the North line of said 11.734 acre tract, a distance of 195.91 feet to a 1/2 inch iron pipe found for angle point;

THENCE North 48 deg. 27 min. 28 sec. East, along the Southeast line of said Canal Easement and the Northwest line of said 11.734 acre tract, a distance of 1420.37 feet to a 1/2 inch iron rod set for the Northwest corner of the herein described tract;

THENCE South 89 deg. 58 min. 38 sec. East a distance of 120.58 feet to the PLACE OF BEGINNING and containing 11.55 acres of land, which leaves a net acreage within the 98.60 acre tract description of 87.05 ACRES.

Bearing Base - Deed Calls in GCWA 36.0 acre tract

Field Notes written from an actual survey made on the ground in April, May and September, 1998, and November, 1999.

STEVE D. ADAMS  
Registered Professional Land Surveyor No. 3666

GCWA7F1

AS PER ORIGINAL



## Exhibit B

### Permitted Encumbrances

1. Easement affecting the subject property shown in instrument from J.J. Fenn, Jr., et ux to Houston Lighting and Power Company dated January 30, 1942, recorded in Volume 416, Page 424 of the Deed Records of Fort Bend County, Texas as located on survey dated November 22, 1999 prepared by Steve D. Adams, RPLS No. 3666.
2. Easement affecting the subject property shown in instrument from J.J. Fenn, Jr. et ux to Houston Lighting and Power Company dated March 15, 1965, recorded in Volume 464, Page 382 of the Deed Records of Fort Bend County, Texas and as located on survey dated November 22, 1999 prepared by Steve D. Adams, RPLS No. 3666.
3. Canal Easement and rights pertaining to same affecting the subject property shown in instrument from J.J. Fenn, Jr. et ux to Briscoe Irrigation Company dated April 2, 1941, recorded in Volume 200, Page 236 of the Deed Records of Fort Bend County, Texas and as located on survey dated November 22, 1999 prepared by Steve Adams, RPLS No. 3666.
4. Easement shown in instrument from Raymond G. Schindler, Trustee to Dow Pipe Line Company dated October 5, 1972 recorded in Volume 575, Page 831 of the Deed Records of Fort Bend County, Texas and as located on survey dated November 22, 1999 prepared by Steve Adams, RPLS No. 3666.
5. The canal easement granted to Robert T. Briscoe by Agreement dated January 3, 1941, recorded in Volume 194, Page 86, covering a five-acre pumping plant site at the Brazos River and a canal right of way 200 feet wide containing 23.98 acres, said easement having been assigned to Briscoe Irrigation Company by instrument recorded in Volume 194, Page 91 of the Deed Records of Fort Bend County, Texas, as affected by memorandum of lease recorded in Volume 2060, Page 1968 of the Official Records of Fort Bend County, Texas, said easement being located and described on survey dated November 22, 1999 prepared by Steve Adams, RPLS No. 3666.
6. Easement for installing Kellner Type Jetties along approximately the South 290 feet of the Brazos River frontage, to Gulf Colorado and Santa Fe Railway Company dated April 11, 1947, recorded in Volume 244, Page 494 of the Deed Records of Fort Bend County, Texas and as located on survey dated November 22, 1999 prepared by Steve Adams, RPLS No. 3666.
7. Easements in favor of Houston Lighting and Power Company as set forth, located and defined in instrument recorded in Volume 649, Page 290 of the Deed Records of Fort Bend County, Texas and as located on survey dated November 22, 1999 prepared by Steve Adams, RPLS No. 3666.

8. An undivided one-half (1/2) of all the oil, gas and other minerals in, on and under the subject property, together with rights pertaining to same, being the same interest reserved by J.J. McKeever, et ux in Deed to J.J. Fenn, Jr., dated January 23, 1931 recorded in Volume 135, Page 108 of the of the Deed Records of Fort Bend County, Texas.
9. One-fourth (1/4) mineral royalty and other rights conveyed and described in royalty deed affecting the West 408.19 acres of 608.19 acres from Annie E. Williams et al to E. Van Arsdale, dated June 9, 1939 recorded in Volume 182, Page 201 of the Deed Records of Fort Bend County, Texas.
10. 1/48th mineral royalty devised to First National Bank in Houston as Trustee under Will of Madie Williams, Deceased, under Probate Nol. 63835, Harris County, Texas Probate Records, a Certified Copy of which is recorded in Volume 587, Page 612 of the Deed Records of Fort Bend County, Texas.
11. Subject to the zoning ordinances of the City of Missouri City, Texas.
12. Subject property lies within the boundaries of Sienna Plantation Levee Improvement District.
13. Underground telephone cable located along rock and caliche road, as located on survey dated November 22, 1999 prepared by Steve D. Adams, RPLS No. 3666.
14. Subject to the rights of others, if any, in and to the existing rock and caliche road, as located on survey dated November 22, 1999 prepared by Steve D. Adams, RPLS No. 3666.
15. Mineral Lease dated May 31, 1993, recorded under Fort Bend County Clerk's File No. 9348392, as affected by Pooling Agreement recorded under Fort Bend County Clerk's Nos. 9522766 and 9675269, and license to mineral lessee to utilize the caliche road referenced above as located on the survey dated November 22, 1999 prepared by Steve D. Adams, RPLS No. 3666, said Mineral Lease also affected by Waiver of Surface Rights and Clarification of Lease dated April 24, 1998 and recorded under Fort Bend County Clerk's No. 200003925.
16. Terms, conditions and stipulations of that certain Miscellaneous Easement, as described and set forth by instrument filed for record under Fort Bend County Clerk's File No. 9550587.
17. All remaining oil, gas and other minerals in, on and under subject property, together with the rights pertaining to same reserved by this Special Warranty Deed.



AS PER ORIGINAL

## EXHIBIT C

TO SPECIAL WARRANTY DEED

### PARCEL "A"

214.69 Acres of Land out of the J.J. Fenn Jr. 510.29 Acre Tract (Vol. 135, Pg. 108; Deed Records); being in the Thomas Barnett League, Abstract 7, Fort Bend County, Texas.

Begin at an iron pipe set on the East topbank of Flat Bank Creek marking the Northwest corner of the J.J. Fenn Jr. 510.29 Acre Tract (Vol. 135, Pg. 100; Deed Records); said corner being the Northwest corner of and place of beginning for this tract;

THENCE, North  $89^{\circ} 35' 30''$  East, 1494.9 feet along a new fence line to an iron pipe found for an angle point; said angle point being the Southeast corner of the Hermann Hospital Estate Tract and Southwest corner of the Oscar Senior Tract;

THENCE, North  $89^{\circ} 45' 40''$  East, along a fence line, at 2778.28 feet pass a corner post, in all 2821.23 feet to a point in the centerline of McKeever Road for the Northerly Northeast corner of this tract;

THENCE, South  $22^{\circ} 04'$  East, along centerline of McKeever Road, pass a 200 foot Canal right-of-way, in all 259.0 feet to a point for the re-entrant corner of this tract;

THENCE, East, with the centerline of McKeever Road, pass the Sugar Land Railroad, at 68 feet, in all 527.0 feet to an angle point;

THENCE, Southeasterly along the centerline of McKeever Road (80 feet wide) along a curve to the right with the following data: Delta  $49^{\circ} 21' 31''$ , Radius; 678.6 feet, Length; 478.0 feet to a point;

THENCE, Southeasterly along the centerline of McKeever Road with the following courses and distances;

South  $41^{\circ} 53' 40''$  East, 231.8 feet to a point;  
South  $29^{\circ} 30' 30''$  East, 1055.9 feet to a point;  
South  $41^{\circ} 27' 00''$  East, 186.20 feet to a point;  
South  $58^{\circ} 26' 30''$  East, 171.20 feet to a point;  
South  $74^{\circ} 01' 50''$  East, 141.60 feet to a point for the Southerly Northeast corner of this tract;

THENCE, South  $8^{\circ} 48' 10''$  West, 63.0 feet to an iron pipe set for the Southeast corner of this tract;

THENCE, South  $89^{\circ} 48' 10''$  West at 435.65 feet pass a point on the centerline of the Sugarland Railroad, in all 509.05 feet to a point for the Southerly Southwest corner of this tract;

THENCE, Northerly along a line 40 feet perpendicular distant from and parallel to the centerline of the Sugarland Railroad with the following courses and distances:

North  $57^{\circ} 10' 30''$  West, 6.30 feet to a point;  
North  $59^{\circ} 50' 20''$  West, 97.5 feet to a point;  
North  $61^{\circ} 37'$  West, 200.7 feet to a point;

PARCEL "B"

A tract of 533.747 acres of land in the Thomas Barnett League, Abstract 7, Fort Bend County, Texas, described by metes and bounds as follows:

Begin at a 3 inch iron pipe marking the most Northerly Northwest corner of Scanlan Foundation 6,020.305-acre Tract; said point being a re-entrant corner of and place of beginning for this Tract;

THENCE, South 1° 18' 20" West, along a fence line, 106.7 feet to a 3 inch iron pipe marking the most Southerly Southeast corner of this Tract;

THENCE, West, along a fence line, at 6221.5 feet past a concrete monument, in all 6437.6 feet to a point being the most Southerly Southwest corner of this Tract;

THENCE, in a Northwesteely direction along the mean average line of the above survey with the following courses and distances:

North 14° 39' 40" West, 19.75 feet to a point;  
 North 24° 12' 10" West, 15.25 feet to a point;  
 North 74° 42' 30" West, 231.6 feet to a point;  
 North 75° 57' 10" West, 207.5 feet to a point;  
 North 65° 41' 30" West, 255.7 feet to a point;  
 North 76° 48' West, 255.55 feet to a point;  
 South 86° 47' 10" West, 383.6 feet to a point;  
 North 83° 17' 20" West, 255.45 feet to a point;  
 North 72° 42' 40" West, 389.15 feet to a point;  
 North 67° 44' West, 141.12 feet to a point;  
 North 55° 44' 10" West, 196.65 feet to a point;  
 North 49° 24' 12" West, 272.15 feet to a point;  
 North 54° 57' West, 75 feet to a point;  
 North 40° 41' West, 301.6 feet to a point;  
 North 47° 55' 10" West, 410.85 feet to a point;  
 North 53° 51' 10" West, 753.4 feet to a point;  
 North 26° 41' 10" West, 334.65 feet to a point;

North 86° 19' West, 996.2 feet to a point;  
 North 70° 41' 40" West, 712.45 feet to a point;  
 North 36° 34' 40" West, 493.3 feet to a point;  
 North 35° 42' 50" West, 371.26 feet to a point being the Northwest corner of this Tract;

THENCE, North 80° 40' 15" East, along a fence line,

RECORDERS MEMORANDUM  
 This page is not satisfactory for photographic recordation due to carbon or photo copy, discolored paper, etc. All block-outs, additions and changes were presented at time instrument was filed and recorded.



PARCEL "B"

THENCE, in a Southeasterly direction along the East Top Bank of Flat Bank Creek with the following courses and distances:

South 45° 44' 40" East, 203.72 feet to a point;  
 North 89° 15' 20" East, 216.2 feet to a point;  
 South 12° 44' 40" East, 135.16 feet to a point;  
 South 11° 57' 40" East, 176 feet to a point;  
 South 56° 52' 20" East, 278.75 feet to a point;  
 South 75° 47' 40" East, 275.6 feet to a point;  
 North 57° 41' 30" East, 137.3 feet to a point;  
 North 89° 52' 40" East, 145.5 feet to a point;  
 South 26° 51' 40" East, 123.3 feet to a point;  
 South 37° 13' 40" East, 9 feet to a point;  
 South 75° 14' 40" East, 111.7 feet to a point;  
 South 30° 9' 40" East, 141.2 feet to a point;  
 South 66° 22' 40" East, 95.5 feet to a point;  
 South 73° 29' 40" East, 155.4 feet to a point;  
 South 17° 0' 40" East, 157.7 feet to a point;  
 South 22° 42' 20" West, 80 feet to a point;  
 South 0° 42' 20" West, 222.86 feet to a point;  
 South 75° 5' 40" East, leaving said creek, 72.2 feet to an angle point;  
 South 64° 55' 40" East, 58.84 feet to an angle point;

THENCE, South 89° 41' 50" East, 5519.5 feet to a point being the Northeast corner of this Tract;

THENCE, in a Southeasterly direction along the Southeast line of Clark Linn - Leland Potter, 10 foot easement (Volume 21, page 25, Deed Record), with the following courses and distances:

South 53° 44' East, 206.5 feet to a point;  
 South 57° 22' East, 202.7 feet to a point;  
 South 61° 18' 50" East, 200.7 feet to a point;

South 59° 32' 10" East, 97.5 feet to a point;  
 South 56° 52' 20" East, 14.07 feet to a point being the most Easterly Southeast corner of this Tract;

THENCE, North 69° 53' 40" West, along a fence line, 1466.24 feet to the place of beginning - containing 633.747 Acres of Land;

RECORDERS MEMORANDUM  
 This page is not satisfactory for photographic recitation due to carbon or photo copy, discolored paper, etc. All block-outs, additions and changes were presented at time instrument was filed and recorded.

Return to.  
Partners Title Company  
5851 San Felipe, Suite  
Houston, TX 77057-150  
890

FILED AND RECORDED  
OFFICIAL PUBLIC RECORDS

*Dianne Wilson*

02-07-2000 01:14 PM 2000009777

DM \$37.00

DIANNE WILSON, COUNTY CLERK  
FORT BEND COUNTY, TEXAS

Official Document

**Document 5-2(b)**

1941 and 1991 Deeds



194/91

project, by the terms of which the work is to commence within twelve (12) months from July 6, 1940 and be completed within twenty-four (24) months from April 6, 1941, and to which order of extension and the record thereof, the same having been duly filed in the office of the County Clerk of Fort Bend/ Brazoria County and Galveston County, Texas, reference is hereto made for all purposes.

TO HAVE AND TO HOLD all and singular the rights and privileges aforesaid to it, the said Briscoe Irrigation Company, its successors and assigns to their proper use and behoof.

IN WITNESS WHEREOF, I have hereunto set my hand to this instrument in triplicate originals this the 7th day of January A.D. 1941.

R. T. Briscoe

THE STATE OF TEXAS,  
COUNTY OF JEFFERSON.

BEFORE ME, the undersigned authority, on this day personally appeared R.T. Briscoe, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN under my hand and seal of office, this 7th day of January A.D. 1941.

Margarette Widner, Notary Public,  
in and for Jefferson County, Texas.

(L.S.)

Filed for record January 15, 1941, at 8:00 o'clock A.M.

Recorded January 16, 1941, at 1:15 o'clock P.M.

Ella Macek, Clerk County Court,  
Fort Bend County, Texas.

By Mildred Clay Deputy

R. T. Briscoe

To #35867

Conveyance of R/W Dated - January 7, 1941.

Briscoe Irrigation Company

THE STATE OF TEXAS,

COUNTY OF JEFFERSON.

KNOW ALL MEN BY THESE PRESENTS:

THAT I, R.T. Briscoe of Angleton, Texas, in consideration of the sum of One (\$1.00) Dollars, and other good and valuable considerations to me paid by Briscoe Irrigation Company, a corporation, with its principal office at Alvin, Texas, have Granted, Sold and Conveyed and by these presents do Grant, Sell and Convey unto Briscoe Irrigation Company all of the rights, titles, privileges, easements, rights-of-way and interests in that certain property as covered by that certain contract of date January 3, 1941, executed by Madie Williams, a feme sole, Annie Williams, a feme sole and Mrs. Rosa W. Taylor, joined pro forma by her husband, James Taylor, designated as Parties of the First Part, and R.T. Briscoe, as Party of the Second Part, which instrument has, or will be, filed for record in the office of the County Clerk of Fort Bend County, Texas, and reference is hereto made to the same for all purpose, including the right to construct, maintain and operate over and across the following described tracts of land, a canal for the purpose of transporting water for irrigation, mining, milling, manufacturing, stock-raising and municipal purposes, and the right to construct, maintain and operate upon the tract hereinafter referred to as Tract No. "A" a pumping-plant, buildings, and machinery for the purpose of

COMPARED



pumping water from the Brazos River into said canal so that the same may be therein transported for all the purposes hereinabove referred to upon, along and through the tracts herein referred to, said tracts of land being more particularly described as follows, to-wit:

TRACT "A": A part of the Thomas Barnett Survey in Fort Bend County, Texas, described by metes and bounds as follows:

Beginning at a Bois d' Arc stake on the top of the East bank of the Brazos River at a distance of 491.4 feet North 25° 04' West from fence corner on the top of said bank of said River, same being in the line between the property of the First Parties and the Arcola Sugar Mills Company property in the Thomas Barnett Survey in Fort Bend County, Texas;

Thence North 36° 21' West 136 feet, North 14° 22' West 41.2 feet, North 58° West 59.2 feet and North 77° 12' West 153 feet to a point for corner;

Thence North 260x2 feet to a stake for corner;

Thence East 550.2 feet to a Bois d' Arc stake for corner;

Thence South 474.6 feet to another Bois d' Arc stake for corner;

Thence West 260 feet to the place of beginning containing 5.00 acres of land.

TRACT "B": A part of the Thomas Barnett Survey in Fort Bend County, Texas, described by metes and bounds as follows, to-wit:

Being the right-of-way for a canal 200 feet in width and being 100 feet on each side of the center line of said right-of-way. The center line of said right-of-way is described by metes and bounds as follows, to-wit:

Beginning at a point on the North line of the foregoing described five acre tract of land at a distance of 177.7 feet west of its Northeast corner;

Thence following a curved line to the right with a radius of 573.0 feet, a distance of 620.3 feet to a stake at P.T. in the center line of an old canal;

Thence following the center line of said old canal as follows: South 79° 15' East a distance of 2333.9 feet to P.C.;

Thence following a curved line to the left with a radius of 1146.0 feet a distance of 631.3 feet to P.T.:

Thence North 69° 11' East a distance of 121.8 feet to a stake on the top high bank of a bayou;

Thence North 60° 17' East 178.7 feet to a stake on the top of the east high bank of said bayou;

Thence North 48° 54' East a distance of 1337.8 feet to a stake at the intersection of the center line of said old canal with a fence line marking the North line of the Williams land and the south line of the Penn land, containing 23.98 acres of land.

TO HAVE AND TO HOLD all and singular the rights and privileges aforesaid to it, the said Briscoe Irrigation Company, its successors, and assigns, to their proper use and behoof.

IN WITNESS WHEREOF, I have here set my hand hereto this the 7th day of January A.D. 1941.

R.T. Briscoe

THE STATE OF TEXAS,  
COUNTY OF JEFFERSON.

BEFORE ME, the undersigned authority, on this day personally appeared R.T. Briscoe, known to me to be the person whose is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN under my hand and seal of office, this 7th day of January A.D. 1941.

Margarette Widner, Notary Public in  
and for Jefferson County, Texas.

(L.S.)

Filed for record January 15, 1941, at 8:00 o'clock A.M.

Recorded January 16, 1941, at 1:40 o'clock P.M.

Ella Macek, Clerk County Court,  
Fort Bend County, Texas.

By Mildred Clay Deputy

Vence Broz, et ux

To #35868

Warranty Deed

Dated - January 8, 1941.

The Supreme Lodge of Slavonic

Benevolent Order of the State

of Texas, (S.P.J.S.T.)

THE STATE OF TEXAS,

COUNTY OF FORT BEND.

KNOW ALL MEN BY THESE PRESENTS:

That we, Vence Broz and wife Josephine Broz, of the County of Fort Bend, State of Texas, for and in consideration of the cancellation of the indebtedness evidenced by the execution and delivery of our one certain note in the principal sum of \$3,513.13, dated October 24, 1934, payable to the order of The Supreme Lodge of Slavonic Benevolent Order of the State of Texas, (S.P.J.S.T.), due January 1st, 1945, and bearing interest from January 1, 1935, at the rate of 6% per annum, both principal and interest payable at Fayetteville, Texas, interest payable annually on January 1st, as it accrues, providing that failure to pay said note when due, or any interest as it accrues, shall at the option of the holder of said note, mature same and it shall at once become due and payable and subject to foreclosure proceedings; and also providing for 10% as attorney's fees if same is placed in the hands of an attorney for collection, which said note is fully described in a Deed of Trust signed by Vence Broz and wife Josephine Broz, to John R. Kubena, Trustee, dated October 24, 1934, and recorded in Vol. 20, page 247 of the Records of Deeds of Trust of Fort Bend County, Texas. have Granted, Sold and Conveyed, and by these presents do Grant, sell and convey unto the said The Supreme Lodge of Slavonic Benevolent Order of the State of Texas, (S.P.J.S.T.), of the County of Fayette, State of Texas, all those certain tracts, lots or parcels of land lying and being situated in Fort Bend County, Texas, and being all of Lots Nos. 5, 6, & 7 in Block No. 45, of the Beasley Townsite, Orchard and Garden Tracts, and which said lots contain 38.52 acres, more or less, and are a part of said Block No. 45 of the Turkey Creek Subdivision according to map or plat of said subdivision of record in the Deed Records of Fort Bend County, Texas, in Book 53, pages 233-234. Said lots 5 and 6 were conveyed to Steve Lunda by R. E. L. Ashley and wife, on July 2, 1918, by deed recorded in Vol. 79, pages 157-158, Deed Records of Fort Bend County, Texas, and Lot No. 7 conveyed to said Steve Lunda by Morris Stern on June 26, 1918, by deed recorded in Vol. 79, pages 156-157, Deed Records of Fort Bend County, Texas, and being the same land conveyed to Vence Broz by Steve Lunda and wife Marie Lunda by deed dated September 28, 1926, and recorded in Vol. 116, page 531, Deed Records of Fort Bend County, Texas; and being the same property described in Deed of Trust signed by Vence Broz and wife Josephine Broz to John R. Kubena, Trustee, dated October 24, 1934, and which is recorded in Vol. 20, page 247 of the Deed of Trust Records of Fort Bend County, Texas.



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01-001432 <sup>wn</sup>  
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GENERAL WARRANTY DEED

THE STATE OF TEXAS §  
§  
COUNTY OF FORT BEND §

Know all men by these presents, that Raymond G. Schindler, Trustee of Fort Bend County, Texas, for and in consideration of the sum of \$42,746 cash to me in hand paid by Galveston County Water Authority whose address is P.O. Box 1651, Texas City, Texas 77592-1651 the receipt of which is hereby acknowledged, and the further sum of \$155,254 secured to be paid and evidenced by grantee's promissory note, of even date herewith, which note is additionally secured by a deed of trust of even date herewith on said property and premises;

Has granted, sold and conveyed, and by these presents does grant, sell and convey unto the said Galveston County Water Authority, all that certain tract or parcel of land containing 36 acres out of the Thomas Barnett Survey, Abstract 7, Fort Bend County, Texas, more fully described by metes and bounds in Exhibit A attached hereto and made a part hereof for all purposes.

Grantor reserves all of the minerals in and under said land, but waives all rights of ingress and egress for the purpose of mining or drilling for the same, but does not waive the right to utilize the surface to conduct seismic work.

This conveyance is made and accepted subject to all valid and subsisting restrictions, easements, leases and rights of way of record, if any, affecting the above described property.

It is recognized that the property conveyed by this Deed is out of certain other property owned by the Grantor ("Grantor's Adjoining Property"). For the Benefit of Grantor's Adjoining Property, in order to permit the orderly development of Grantor's Adjoining Property, the property conveyed hereby shall be restricted against the use as a sanitary landfill, waste disposal facility, sewage treatment plant, junk yard, recycling facility, and incineration or scrap metal yard; provided, however, such restriction shall not preclude use of such property for the deposit of sand, earth, or gravel.

To have and to hold the above described property and premises, together with all and singular the rights and appurtenances thereto in anywise belonging, unto the said grantee, its successors and assigns forever; and I do hereby bind myself, my heirs, executors and administrators to warrant and forever defend all and singular said premises unto the said grantee, its successors and assigns,

against every person whomsoever lawfully claiming or to claim the same or any part thereof, subject to all valid and subsisting restrictions, easements, leases, and rights of way properly of record.

But it is expressly stipulated and agreed that a vendor's lien and the superior title are retained against the above described property and premises until said note is fully and finally paid according to its fact and tenor, effect and reading, when this deed shall become absolute.

Grantor retains an easement over, across and through the area within Flat Bank Creek for the purpose of drainage of other property owned by Grantor. Grantor retains the right to improve and clean the easement, and remove all vegetation or any impediments that restrict the flow of drainage in Flat Bank Creek to the extent same is located within the Property conveyed hereby. Grantee shall not restrict or impede the flow of drainage in Flat Bank Creek.

Witness my hand this 15th day of May, 1991.

R. G. Schindler, Trustee  
Raymond G. Schindler, Trustee

THE STATE OF TEXAS

COUNTY OF Harris

This instrument was acknowledged before me on the 15th day of May, 1991, by RAYMOND G. SCHINDLER, in the capacity therein stated.

Marion C. Bergen  
Notary Public  
In and for the State of Texas  
My Commission Expires: 12-10-94

(SEAL)



RETURN TO:  
Texas State Title  
4615 Post Oak Place  
Suite 104  
Houston, Texas 77027

ATTN: Wanda Maye



FIELD NOTES

36.00 ACRES OF LAND, BEING A PART OF A CERTAIN 633.747 ACRE TRACT OWNED BY RAYMOND G. SCHINDLER IN THE THOMAS BARNETT LEAGUE, ABSTRACT 7, FORT BEND COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at an iron pipe found at the Northwest corner of a certain 5.0 acre tract described as Tract "A" in a Deed recorded in Volume 194, Page 91, Deed Records of Fort Bend County, Texas, said point being located North 89 deg. 57 min. West - 8198.86 feet, North 00 deg. 03 min. East - 645.12 feet, and North 89 deg. 41 min. West - 550.2 feet from an iron rod found at the lower Southeast corner of the aforementioned 633.747 acre tract;

THENCE South 00 deg. 08 min. West, along the West line of said 5.0 acre tract, a distance of 245.36 feet to an iron pipe found on the North bank of the Brazos River;

THENCE North 79 deg. 54 min. 25 sec. West, along said bank, a distance of 269.03 feet to an iron rod found at the Southeast corner of a called 40.691 acre tract surveyed for the Fort Bend County Drainage District;

THENCE North 31 deg. 44 min. 52 sec. East, along the East line of the Fort Bend County Drainage District Tract, said line being Easterly of the centerline of Steep Bank Creek, a distance of 41.58 feet to the P.C. of a curve to the left;

THENCE, around said curve to the left having a central angle of 28 deg. 46 min. 33 sec. and a radius of 700.0 feet, a distance of 351.56 feet to an iron rod set for corner;

THENCE North 02 deg. 43 min. 40 sec. East a distance of 251.82 feet to an iron rod found at the P.C. of a curve to the right;

THENCE, around said curve to the right having a central angle of 39 deg. 09 min. 35 sec. and a radius of 50.0 feet, a distance of 34.17 feet to an iron rod;

THENCE North 41 deg. 52 min. 40 sec. East a distance of 460.47 feet to an iron rod found for corner at the P.C. of a curve to the left;

THENCE, around said curve to the left having a central angle of 62 deg. 18 min. 53 sec. and a radius of 450.0 feet, a distance of 489.42 feet to an iron rod;

Page 2 of Field Notes on 36.00 acres of land

THENCE North 20 deg. 26 min. 14 sec. West a distance of 25.67 feet to a point for corner at the intersection of the East line of the Fort Bend County Drainage District Tract with the centerline of Flat Bank Creek;

THENCE up the centerline of Flat Bank Creek with the following meanders:

North 67 deg. 52 min. 40 sec. East - 14.79 feet,  
 South 88 deg. 17 min. 21 sec. East - 188.17 feet,  
 South 80 deg. 10 min. 23 sec. East - 191.59 feet,  
 South 57 deg. 49 min. 46 sec. East - 325.07 feet,  
 South 57 deg. 39 min. 55 sec. East - 101.45 feet,  
 South 66 deg. 58 min. 57 sec. East - 131.48 feet, and  
 North 68 deg. 22 min. 58 sec. East - 568.26 feet

to the Northeast corner of the herein described tract;

THENCE South 01 deg. 41 min. 13 sec. East, at 145.0 feet pass an iron rod, and continue for a total distance of 1002.75 feet to an iron rod set in the North line of a 200.0 foot wide canal easement described as Tract "B" in the aforementioned Deed recorded in Volume 194, Page 91, Deed Records;

THENCE North 79 deg. 44 min. West, along the North line of said easement, a distance of 842.80 feet to an iron rod set at the Point of Curve of a curve to the left;

THENCE, along said curve to the left having a radius of 673 feet, a distance of 732.64 feet to an iron rod set in the North line of the aforementioned 8.0 acre tract;

THENCE North 89 deg. 41 min. West, along said line, a distance of 253.75 feet to the PLACE OF BEGINNING and containing 36.00 acres of land.



Field Notes written from an actual survey made on the ground during the month of April, 1990, and revised October 16, 1990.

*Steve D. Adams*  
 STEVE D. ADAMS  
 Registered Professional Land Surveyor No. 3666

GCHAL

2301 678

FILED

91 MAY 16 P2:55

*Dianna Wilson*  
COUNTY CLERK  
FORT BEND COUNTY, TEXAS

STATE OF TEXAS COUNTY OF FORT BEND  
I, hereby certify that this instrument was filed on  
the date and time stamped herein by me and was duly recorded  
in the volume and page of the Official Records of Fort Bend  
County, Texas as stamped by me.

MAY 20 1991



*Dianna Wilson*  
County Clerk, Fort Bend Co., Tex.

Unofficial Document

**Document 5-2(c)**

1941 Easements



THE STATE OF TEXAS,  
COUNTY OF HARRIS.

THIS AGREEMENT between Madie Williams, a feme sole,  
Annie Williams, a feme sole, and Mrs. Rosa W. Taylor, joined herein  
pro forma by her husband, James Robert Taylor, all of whom are  
residents of Harris County, Texas, and are hereinafter referred to  
as First Parties, and Robert T. Briscoe, a resident of Brazoria  
County, Texas, hereinafter referred to as Second Party, witnesseth:

1.

In consideration of the sum of Twenty eight hundred and  
ninety-eight (\$2898.00) Dollars to them in hand paid by Second Party,  
and of the further considerations hereinafter set forth, First  
Parties have granted, sold and conveyed, and do by these presents  
grant, sell and convey unto the Second Party, his heirs and assigns,  
upon the terms and conditions hereinafter set forth, the right to  
construct, maintain and operate over and across the land hereinafter  
described as "FIRST TRACT" and "SECOND TRACT" a canal for the purpose  
of transporting water for irrigation, mining and municipal purposes,  
and to construct, maintain and operate upon tract hereinafter referred  
to as "FIRST TRACT" a pumping plant, buildings and machinery for the  
purpose of pumping water from the Brazos River into said canal so that  
same may be therein transported for irrigation, mining and municipal  
purposes.

The tracts of land above referred to are more particular-  
ly described as follows:

FIRST TRACT; A part of the Thomas Barnett Survey  
in Fort Bend County, Texas, described by metes and  
bounds as follows:

Beginning at a Bois d' Arc stake on the top of the  
East bank of the Brazos River at a distance of 191.4  
feet North 25° 04' West from fence corner on the top  
of said bank of said River, same being in the line  
between the property of the First Parties and the  
Arcola Sugar Mills Company property in the Thomas  
Barnett Survey in Fort Bend County, Texas;

Thence North 36° 21' West 136 feet, North 14° 22' West 41.2 feet, North 58° West 59.2 feet and North 77° 12' West 153 feet to a point for corner;

Thence North 260.2 feet to a stake for corner;

Thence East 550.2 feet to a Bois d' Arc stake for corner;

Thence South 474.9 feet to another Bois d' Arc stake for corner;

Thence West 260 feet to the place of beginning, containing 5.00 acres of land.

SECOND TRACT: A part of the Thomas Barnett Survey in Fort Bend County, Texas, described by metes and bounds as follows, towit:

Being the right-of-way for a canal 200 feet in width and being 100 feet on each side of the center line of said right-of-way. The center line of said right of way is described by metes and bounds as follows, towit:

Beginning at a point on the North line of the foregoing described five acre tract of land at a distance of 177.7 feet West of its Northeast corner:

Thence following a curved line to the right with a radius of 573.0 feet, a distance of 620.3 feet to a stake at P.T. in the center line of an old canal;

Thence following the center line of said old canal as follows: South 79° 15' East a distance of 2333.9 feet to P.C.;

Thence following a curved line to the left with a radius of 1146.0 feet a distance of 631.3 feet to P.T.;

Thence North 69° 11' East a distance of 121.8 feet to a stake on the top high bank of a bayou;

Thence North 60° 17' East 178.7 feet to a stake on the top of the east high bank of said bayou;

Thence North 48° 54' East a distance of 1337.8 feet to a stake at the intersection of the center line of said old canal with a fence line marking the North line of the Williams land and the South line of the Fenn land, containing 23.98 acres of land.

TO HAVE AND TO HOLD the rights and easements thus conveyed unto Second Party, his heirs and assigns, upon the terms and conditions hereinafter set forth.

2.

First Parties hereby bind themselves, their heirs, executors and administrators, to warrant and forever defend all and singular the rights and easements thus conveyed unto the Second Party, his heirs and assigns, against every person whomsoever lawfully claiming or to claim the same, or any part thereof.

3.

Second Party hereby covenants that the canal to be constructed on said lands, and on other lands in the vicinity of said lands, will be so constructed and maintained by Second Party that it will not divert the natural flow of the surface waters or impound such waters, and will not obstruct any river, creek, bayou, gulley, slough, ditch or other well defined natural drainage. Second Party further covenants that if said canal crosses any creek, bayou, gulley, slough, ditch or other well defined natural drainage he will construct and maintain a flume across the same with adequate provision to take care of all of such waters.

4.

Second Party further covenants that he will erect and maintain in good repair and condition three bridges across said canal at such places as are designated by First Parties, together with proper approaches thereto, said bridges to be made of heavy lumber, to be not less than fourteen (14) feet wide, and to have guard railings on each side. Said bridges are to be constructed as the work on the canal progresses so that passage ways from one side of the canal to the other shall be promptly available and shall not be interfered with.

5.

Second Party further covenants that he will grade ~~grade~~ the present farm road extending toward the Brazos River, and will grade a continuation of such road to said pumping plant site, and that he will maintain such road in good condition as a graded farm road. Second Party shall have the privilege of using such road for

the purpose of ingress and egress for Second Party and his employees in going to and from said canal and pumping plant. Second Party further covenants that he will maintain a gate and cattle guard where said road enters the property of First Parties, and that he will provide a lock for said gate and maintain a lock thereon, furnishing First Parties keys for such lock. Said cattle guard shall be made of iron pipe, and said gate and cattle guard shall be constructed in a good workmanlike manner. Second Party further covenants that he will construct and maintain in good repair and condition a crossing across the Sugarland Railroad where the present road entering the premises of the First Parties crosses the dump of said railroad just before it reaches the property of First Parties, and that Second Party will construct and maintain approaches to such crossing so as to make same passable and keep same in reasonable condition for use.

6.

It is understood and stipulated that Second Party acquires by this instrument only the easement to use such land and premises, as aforesaid, without any rights in the oil, gas or other minerals in or under the same, and it is understood and agreed that oil wells may be sunk at any place on the property covered by this easement provided they are so constructed as not to interfere with the reasonable use of such property as is then being made by Second Party under the terms of the said easements.

7.

Second Party further covenants that he will so construct his improvements at or near the Brazos River as to not cause any caving or sloughing away of the banks of the Brazos River, and if, by reason of the operations of Second Party such bank is caused to cave or slough off, Second Party shall take such steps as necessary to stop such caving and prevent future caving and sloughing.

8.

Second Party further covenants that he will, at his own expense, remove three houses which are now located on the ground



covered by said easements, moving them to such other places on the property of the First Parties as First Parties may designate; that he will place under said houses properly constructed brick or concrete blocks or pillars which shall be not less than twelve (12) inches by twelve (12) inches at the bottom and not less than eight (8) inches by eight (8) inches at the top; that after said houses are removed Second Party will place same in as good condition as they now are; that the elevation of the houses above sea level shall be the same as their present elevation above sea level; that he will construct two water wells at points to be designated by First Parties near the location of the moved improvements, such wells to be sunk to the water bearing sand or level from which the wells now near the houses to be moved have been sunk, and such wells to be of the same character and quality as the old wells. Second Party further agrees that if during the first hard rain that comes after the houses have been moved any leaks show up in such houses or the roofs thereof Second Party will see that such leaks are properly repaired and that such repairs are made as will stop such leaks.

9.

If the remainder of the land of First Parties, or any part thereof, is damaged at any time by reason of the operations of such canal and pumping plant, Second Party shall pay First Parties the amount of such damages.

10.

Second Party agrees that so long as this easement continues in force he will pay all taxes on the said two tracts, beginning with the taxes for the year 1941, it being understood that if any separate tax is assessed on the oil, gas and minerals under said two tracts, same shall be paid by First Parties.

11.

The easements created by this instrument shall remain in full force and effect so long as such pumping plant and canal

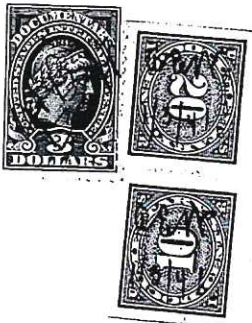
are operated for the purpose of furnishing water for irrigation purposes without any cessation of more than three (3) consecutive years, but it is understood and agreed that if Second Party fails to begin operating said pumping plant and canal for the purpose of transporting water for irrigation purposes within three (3) years of this date, or if there is a cessation of as much as three (3) years in the operation of such pumping plant and canal for the purpose of transporting water for irrigation purposes, then all the rights and easements created by this instrument shall cease and terminate and shall revert to First Parties without any re-entry or action on their part. In this connection it is understood and agreed that in the event that this easement terminates, Second Party shall have the right to remove from said premises his pumping plant and machinery and pumping equipment provided that he does so within one (1) year after such termination, and Second Party covenants that, if requested to do so, he will upon such termination restore the land to its present condition.

12.

The terms and provisions of this agreement shall extend to the heirs, executors, administrators and assigns, respectively, of the respective parties, and the covenants and agreements herein contained shall be construed to be covenants running with the easements and rights created by this instrument, and shall be binding on all parties acquiring the rights of Second Party, or any part thereof, under this instrument.

EXECUTED IN TRIPLICATE this 3<sup>rd</sup> day of January, A. D.

1941.



Miss Annie C. Williams  
Madie Williams  
Mrs. Robert H. Taylor  
J. R. Taylor  
FIRST PARTIES  
R. T. Brison  
SECOND PARTY

THE STATE OF TEXAS,

COUNTY OF HARRIS.

BEFORE ME, the undersigned authority, on this day personally appeared Madie Williams and Annie Williams, femes sole, both known to me to be the persons whose names are subscribed to the foregoing instrument, and severally aoknowledged to me that they executed the same for the purposes and consideration therein expressed.

GIVEN under my hand and seal of office this 3<sup>rd</sup> day of January, A. D. 1941.

Walter F. Brown  
Notary Public, Harris County,  
Texas.

THE STATE OF TEXAS,

COUNTY OF HARRIS.

BEFORE ME, the undersigned authority, on this day personally appeared James Robert Taylor and wife, Mrs. Rosa W. Taylor, both known to me to be the persons whose names are subscribed to the foregoing instrument, and severally acknowledged to me that they executed the same for the purposes and consideration therein expressed; and the said Mrs. Rose W. Taylor, wife of the said James Robert Taylor, having been examined by me privily and apart from her husband, and having the same by me fully explained to her, she, the said Mrs. Rose W. Taylor, acknowledged such instrument to be her aot and deed, and declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

GIVEN under my hand and seal of office this 3<sup>rd</sup> day of January, A. D. 1941.

Walter F. Brown  
Notary Public, Harris County,  
Texas.

THE STATE OF TEXAS,

COUNTY OF

BEFORE ME, the undersigned authority, on this day personally appeared Robert T. Briscoe, known to me to be the person whose name is subscribed to the foregoing instrument, and aoknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN under my hand and seal of office this 3<sup>rd</sup> day of January, A. D. 1941.

Walter F. Brown  
Notary Public,  
County, Texas.

County Clerk  
Hester Harris

of Hester Harris, V. D. Tarr.

State under my hand and seal of office this 15th day

of Hester Harris.

to be that he executed the same for the Hester Harris and consideration

THE STATE OF TEXAS }

County of Fort Bend }

I, Ella Macek, County Clerk in and for said County, do hereby certify that the foregoing instrument, with its Certificate of Authentication, was filed for record in my office the 15 day of Jan.

A. D. 1944, at 8:00 o'clock a M., and duly recorded the 16 day of Jan.

A. D. 1944, at 11:40 o'clock a M., in the Deed records of said County, in Vol. 194

on Page 86

WITNESS my hand and the seal of the County Court of said County, at office in Richmond, Texas, the day and year last above written.

By Wilbur Clay Deputy.

ELLA MACEK, Clerk County Court,  
Fort Bend County, Texas.

of Hester Harris, V. D. Tarr. State under my hand and seal of office this 15th day of Hester Harris. to be that he executed the same for the Hester Harris and consideration of the foregoing instrument, and solemnly acknowledged to me that both known to me to be the persons whose names are subscribed to the foregoing instrument, and solemnly acknowledged to me that the undersigned instrument, on this day

County of Hester.

the State of Texas.

County Clerk  
Hester Harris

of Hester Harris, V. D. Tarr.

State under my hand and seal of office this 15th day

of Hester Harris.

to be that he executed the same for the Hester Harris and consideration of the foregoing instrument, and solemnly acknowledged to me that both known to me to be the persons whose names are subscribed to the foregoing instrument, and solemnly acknowledged to me that the undersigned instrument, on this day

County of Hester.

the State of Texas.



35863

WASEMENT AGREEMENT

BETWEEN

LADIE WILLIAMS ET AL

AND

ROBERT T. BRISCOE

COMPARED

FILED FOR RECORD THIS

JAN 15 1941

At 8 o'clock PM  
Ella Mae  
County Clerk Fort Bend Co, Texas  
Wm. J. Dwyer

Wm. J. Dwyer



THE STATE OF TEXAS  
COUNTY OF JEFFERSON

KNOW ALL MEN BY THESE PRESENTS:

That I, R. T. Briscoe of Angleton, Texas, in consideration of the sum of One (\$1.00) Dollar, and other good and valuable considerations to me paid by Briscoe Irrigation Company, a corporation, with its principal office at Alvin, Texas, have GRANTED, SOLD and CONVEYED and by these presents do GRANT, SELL and CONVEY unto Briscoe Irrigation Company all of the rights, titles, privileges, easements, rights-of-way and interests in that certain property as covered by that certain contract of date January 3, 1941 executed by Madie Williams, a feme sole, Annie Williams, a feme sole and Mrs. Rosa W. Taylor, joined pro forma by her husband, James Taylor, designated as Parties of the First Part, and R. T. Briscoe, as Party of the Second Part, which instrument has, or will be, filed for record in the office of the County Clerk of Fort Bend County, Texas, and reference is hereto made to the same for all purposes, including the right to construct, maintain and operate over and across the following described tracts of land, a canal for the purpose of transporting water for irrigation, mining, milling, manufacturing, stock-raising and municipal purposes, and the right to construct, maintain and operate upon the tract hereinafter referred to as Tract No. "A" a pumping plant, buildings and machinery for the purpose of pumping water from the Brazos River into said canal so that the same may be therein transported for all the purposes hereinabove referred to upon, along and through the tracts herein referred to, said tracts of land being more particularly described as follows, to-wit:

TRACT "A": A part of the Thomas Barnett Survey in Fort Bend County, Texas, described by metes and bounds as follows:

Beginning at a Bois d' Arc stake on the top of the East bank of the Brazos River at a distance of 191.4 feet North 25° 04' West from fence corner on the top of said bank of said River, same being in the line between the property of the First Parties and the Arcola Sugar Mills Company property in the Thomas Barnett Survey in Fort Bend County, Texas;

#2-

Thence North 36° 21' West 136 feet, North 14° 22' West 41.2 feet, North 58° West 59.2 feet and North 77° 12' West 153 feet to a point for corner;

Thence North 260.2 feet to a stake for corner;

Thence East 550.2 feet to a Bois d' Arc stake for corner;

Thence South 474.9 feet to another Bois d' Arc stake for corner;

Thence West 260 feet to the place of beginning containing 5.00 acres of land.

TRACT "B": A part of the Thomas Barnett Survey in Fort Bend County, Texas, described by metes and bounds as follows, to-wit:

Being the right-of-way for a canal 200 feet in width and being 100 feet on each side of the center line of said right-of-way. The center line of said right-of-way is described by metes and bounds as follows, to-wit:

Beginning at a point on the North line of the foregoing described five acre tract of land at a distance of 177.7 feet West of its Northeast corner;

Thence following a curved line to the right with a radius of 573.0 feet, a distance of 620.3 feet to a stake at P. T. in the center line of an old canal;

Thence following the center line of said old canal as follows: South 79° 15' East a distance of 2333.9 feet to P. C.;

Thence following a curved line to the left with a radius of 1146.0 feet a distance of 631.3 feet to P. T.;

Thence North 69° 11' East a distance of 121.8 feet to a stake on the top high bank of a bayou;

Thence North 60° 17' East 178.7 feet to a stake on the top of the east high bank of said bayou;

Thence North 48° 54' East a distance of 1337.8 feet to a stake at the intersection of the center line of said old canal with a fence line marking the North line of the Williams land and the South line of the Fenn land, containing 23.98 acres of land.

TO HAVE AND TO HOLD all and singular the rights and privileges aforesaid to it, the said Briscoe Irrigation Company, its successors, and assigns, to their proper use and behoof.

IN WITNESS WHEREOF, I have here set my hand hereto this the 7<sup>th</sup> day of January, A.D., 1941.

R. T. Briscoe

#3-

THE STATE OF TEXAS

COUNTY OF *Jefferson*

Before me, the undersigned authority, on this day personally appeared R. T. Briscoe, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office, this 7<sup>th</sup> day of January, A.D., 1941.

*Margarette Widner*  
Notary Public, in and for  
*Jefferson* County, Texas.



THE STATE OF TEXAS }  
County of Fort Bend

I, Ella Macek, County Clerk in and for said County, do hereby certify that the foregoing instrument, with its Certificate of Authentication, was filed for record in my office the 15 day of Jan.  
A. D. 1944, at 8:00 o'clock A M., and duly recorded the 16 day of Jan.  
A. D. 1944, at 1:40 o'clock P M., in the Deed records of said County, in Vol. 194  
on Page 91

WITNESS my hand and the seal of the County Court of said County, at office in Richmond, Texas, the day and year last above written.

By Milady Clay Deputy.

ELLA MACEK, Clerk County Court,  
Fort Bend County, Texas.



35867

R. T. BRISCOE

-to-

BRISCOE IRRIGATION COMPANY

COMPARED

CONVEYANCE OF RIGHT OF WAY  
AND EASEMENT

FILED FOR RECORD THIS

JAN 15 1941

At 8 o'clock PM M.

ella Mack  
County Clerk, Fort Bend County, Texas  
Wm. J. Sptey

Wm. J. Sptey



**Document 5-2(d)**

General Land Office Easement

# The State of Texas



Austin, Texas

## MISCELLANEOUS EASEMENT (PIPELINES)

ME950014

STATE OF TEXAS

§

COUNTY OF FORT BEND

§

§

KNOW ALL MEN BY THESE PRESENTS:

This Miscellaneous Easement (the "Agreement"), ME950014, is granted by virtue of the authority granted in Section 51.291, *et seq.*, TEX. NAT. RES. CODE, 31 TEX. ADMIN. CODE §13.12, *et seq.*, and all other applicable statutes and rules, as the same exist on the date hereof or as they may be amended from time to time.

### ARTICLE I. PARTIES

1.01. In consideration of the mutual covenants and agreements set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the STATE OF TEXAS, acting by and through the Commissioner of the General Land Office, (the "GRANTOR"), hereby grants to Gulf Coast Water Authority, whose address is 3630 FM 1765, Texas City, TX 77591-4824, phone number (409) 797-4909, (the "Grantee"), a non-exclusive easement for the purposes identified in Article V.

### ARTICLE II. PREMISES

2.01. The easement is located across State-owned land in Fort Bend County, Texas, described as follows:

Brazos River and the easement is a right-of-way 2.1 rods long and 68 feet wide, being 34 feet either side of a centerline formed by the Improvements (as hereinafter defined), as constructed (the "Premises"). In addition, if repair and/or replacement of the pipeline is necessary, for a period not to exceed 60 days, Grantee shall again be granted additional easement width which shall be 100 feet wide being 50 feet either side of the centerline.

The Premises are further described or depicted on the Vicinity Map attached hereto as Exhibit A and the Survey Map attached hereto as Exhibit B, collectively incorporated by reference for descriptive purposes.

2.02. Grantee acknowledges and agrees that when the Improvements (as hereinafter defined) are placed on the Premises, the location of such Improvements within the easement shall thereby become fixed at such location and shall not be changed except by an amendment to this Agreement signed by both parties hereto and subject to any approval by any other governmental agency with jurisdiction over same.

2.03. GRANTEE HAS INSPECTED THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES AND ACCEPTS THE SAME "AS IS", IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. THE GRANTOR DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER WARRANTY WHATSOEVER NOT EXPRESSLY SET FORTH IN THIS AGREEMENT. THE GRANTOR AND GRANTEE HEREBY AGREE AND



ACKNOWLEDGE THAT THE USE OF THE TERM "GRANT" IN NO WAY IMPLIES THAT THIS EASEMENT IS FREE OF LIENS, ENCUMBRANCES AND/OR PRIOR RIGHTS. NOTICE IS HEREBY GIVEN TO GRANTEE THAT ANY PRIOR GRANT AND/OR ENCUMBRANCE MAY BE OF RECORD, AND GRANTEE TAKES SUBJECT TO ANY SUCH PRIOR GRANT AND/OR ENCUMBRANCE. GRANTEE IS ADVISED TO EXAMINE THE RECORDS IN THE ARCHIVES AND RECORDS DIVISION OF THE GENERAL LAND OFFICE, 1700 NORTH CONGRESS AVENUE, AUSTIN, TEXAS 78701-1495, AND ALL OTHER LAND TITLE RECORDS OF THE COUNTY OR COUNTIES IN WHICH THE PREMISES ARE LOCATED. THE PROVISIONS OF THIS SECTION SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS EASEMENT.

### ARTICLE III. TERM

3.01. This Agreement is for a period of ten (10) years, beginning on August 1, 2015, and ending on July 31, 2025, unless renewed, amended, or sooner terminated as authorized by law or as set forth herein.

3.02. Provided that Grantee has complied with all provisions of this Agreement, Grantee shall have the right to extend and renew this Agreement pursuant to 31 TAC §13.17(c) and (d) for an additional like term based on the then current rate schedule and on the terms and conditions provided hereunder, by taking the following actions:

- (i) providing written notice to the GRANTOR of Grantee's intent to renew the Agreement not less than ninety (90) days prior to expiration of the term of this Agreement; and
- (ii) completing and submit to the GRANTOR for approval, an application for renewal within thirty (30) days following the notice provided in Section 3.02(i); and
- (iii) paying the applicable renewal fee, pursuant to the rate schedule in effect at the time of renewal; and
- (iv) providing documentation showing the current location of the Improvements. This documentation shall include spatial coordinates sufficient for determining that the pipeline(s) lie within the approved Premises. Such information may be in the form provided to the U.S. Department of Transportation, provided that such documentation includes the current location and spatial coordinates. Notwithstanding the foregoing, and provided that the pipeline has been in place for at least twenty (20) years (an "older pipeline"), Grantee may, in lieu of providing such actual dimensions and spatial coordinates, satisfy the requirements of this subsection (iv) by providing a certified written statement by a Professional Engineer which states that the engineer, despite having employed best efforts to do so, can not ascertain the burial depth and/or location coordinates of such existing pipeline from Grantee's existing records and documentation. Any such certified statement shall also include any documentation in Grantee's possession relating to either the actual dimensions or spatial coordinates of the Improvements. If Grantee, at any time, later discovers or determines the actual burial depth and/or location coordinates of an older pipeline, Grantee agrees to submit such documentation to GRANTOR. If either GRANTOR or Grantee determine that an older pipeline is not actually located within the right of way described in this Agreement, both GRANTOR and Grantee will enter into an amendment to this Agreement to correct the right of way description provided such right of way is located on State-owned land. In any event, Grantee will indemnify GRANTOR pursuant to Section 8.01 of this Agreement even if some or all of the Improvements are not located on State-owned land.

3.03. In the event that Grantee shall fail to comply with the requirements of Section 3.02, Grantee shall be in default hereunder; however, the Easement shall not terminate until GRANTOR provides notice of such failure and allows a period of thirty (30) days for Grantee to cure such failure and default. Grantee's failure to comply with Section 3.02, even if subsequently cured to GRANTOR'S satisfaction, shall be deemed a forfeiture of any right Grantee may have to renew the Agreement. GRANTOR may require (i) the full then-current fee as calculated for a new easement, or, (ii) the applicable renewal fee pursuant to the rate schedule in effect at the time of renewal, plus an administrative penalty as determined by GRANTOR.

#### ARTICLE IV. CONSIDERATION AND TAXES

4.01. A. As consideration (Consideration) for the granting, or if applicable, renewal of this easement, Grantee agrees to pay the GRANTOR (payable to the Commissioner of the General Land Office at Austin, Texas) the sum of Four Thousand and 00/100 Dollars (\$4,000.00), due and payable upon the execution of this Agreement.

B. Past due Consideration and other past due payments shall bear interest as provided in TEX. NAT. RES. CODE Section 51.301, as amended from time to time. Failure of Grantee to make a payment on or before the date the same becomes due shall be deemed an act of default and, at the GRANTOR'S option, cause all payments to become due and payable immediately; provided, however, GRANTOR shall give Grantee notice of such default and allow a period of thirty (30) days within which to cure the default before exercising such option to accelerate such payments.

4.02. In addition to the above, Grantee shall pay and discharge any and all taxes, general and special assessments, and other charges which during the term of this Agreement may be levied on or assessed against Grantee's interest in the Premises or on the Improvements constructed thereon.

4.03. Grantee agrees to and shall protect and hold the GRANTOR harmless from liability for any and all such taxes, charges, and assessments, together with any penalties and interest thereon, and from any sale or other proceeding to enforce payment thereof.

#### ARTICLE V. USE OF THE PREMISES

5.01. Grantee and Grantee's employees, contractors, and agents shall have the right to use the Premises for a right-of-way to construct, maintain, operate, inspect, repair, change the size of, and replace one (1) water intake structure and three (3) 70-inch O.D. water intake pipelines (the "Improvements"). Grantee shall not change (i) the operation of the pipeline in any material respect or (ii) the category of products therein, without GRANTOR'S written permission, such permission not to be unreasonably withheld. It shall not be unreasonable for GRANTOR to withhold its consent for reasons that include, but are not limited to, Grantee's request for: a change in the category of products to be transported that is more "sour" (with reference to hydrogen sulfide content), or that is more volatile, than the original product category to be transported as contemplated by the Agreement; or, a change to a category of products that includes any non-hydrocarbon substances. Also, it shall not be unreasonable for GRANTOR to (a) condition its consent on Grantee procuring and providing proof to GRANTOR of adequate insurance to protect the Premises and (b) charge fees for (i) additional pipelines, and (ii) changes in use operation, including but not limited to, a use separate and apart from the original use contemplated by the Agreement, e.g. fiber optics and reverse flow. GRANTOR agrees to grant or deny such permission within thirty (30) days following Grantee's request for a category use change, provided such request includes all information necessary for GRANTOR to make an informed decision.

5.02. A. The GRANTOR and Grantee hereby acknowledge and agree that each shall have reciprocal rights of ingress and egress to and from the Premises across contiguous or adjacent State-owned land or land owned by Grantee, provided in the exercise of this right the GRANTOR and Grantee agree not to unreasonably interfere with the other party's (or that party's agents, assignees, or designees) use of its property. At its sole cost, risk, and expense, Grantee shall have the right of ingress and egress for the purposes authorized by Section 5.01 and such right is not granted for any other purpose. Grantee and the GRANTOR mutually agree to coordinate the use of contiguous or adjacent State-owned land or land owned by Grantee, respectively, and to exercise such right of use only to the extent and in the manner allowed by the respective interests of the parties in the subjects lands and for the length of time necessary to provide access to and from the Premises. Notwithstanding any other provisions to the contrary, no easement is created by this Section 5.02; instead, a license is granted to the parties and their respective officers, employees, agents and contractors for the limited purposes set forth herein.

B. Grantee acknowledges and agrees that the GRANTOR'S right of ingress and egress described in Section 5.02.A. of this Agreement shall be and remain in effect as long as the Improvements and any other structure placed on the Premises by Grantee remain on the Premises, as necessary for the GRANTOR to confirm the removal (in whole or



in part) of the Improvements, and/or until any claims of liability against GRANTOR arising in connection with the Improvements are finally resolved. Such right of ingress and egress shall survive the expiration or earlier termination of this Agreement, but only for so long as the Improvements remain on the Premises and/or any claims for liability have not been finally resolved.

5.03. A. Grantee's use of the Premises is subject to and contingent upon compliance with the following covenants, obligations and conditions (the "Special Conditions"):

1. High visibility navigation aids, consistent with U.S. Coast Guard guidance, shall be installed and maintained by the Grantee upon completion of construction to ensure integrity of the structures and safety to the general public.
2. Grantee is responsible for maintaining all structures authorized under this contract in good repair and safe condition, and in compliance with all existing state and federal regulations governing such work.
3. Grantee is required to perform mitigation and/or pay surface damage fees according to the Grantor's policy in effect at the time damages occur for any and all surface damages resulting from actions of Grantee's employees, contractors, and/or agents during the term of this easement. If mitigation is required Grantee will be notified in writing by the Grantor of the terms and conditions under which the mitigation shall be conducted. Such mitigation and/or payment of damage fees shall be performed in the manner and within the time frame specified in written notice provided by the Grantor to Grantee following said damages.
4. Clearing of natural vegetation on stream banks will be limited to that material which poses a hazard or a hindrance to the construction of the improvements.

B. Prior to any construction, installation, repair, or other activities on the Premises, Grantee shall provide written notice of all the terms of this Agreement relating to the particular activity to any contractor and/or agent involved in any such activity. On request, Grantee shall send a copy of such notice to the General Land Office, ATTN: Asset Inspection, 1700 North Congress Avenue, Austin, Texas 78701-1495.

5.04. GRANTOR shall have the right to use or to permit the use of any or all of the Premises for any purpose deemed, in GRANTOR'S sole discretion, not to be inconsistent with Grantee's easement grant. GRANTOR, its agents, representatives and employees shall have the right to enter upon the Premises at any reasonable time (or any time in case of emergency) for purposes of inspection, repair, and any other purpose necessary to protect GRANTOR'S interests therein. Except in the event of an emergency, in which case no notice is required by GRANTOR, if GRANTOR reasonably believes that a repair is necessary to protect the health and safety of the public, the environment, or the value of GRANTOR'S property, GRANTOR shall give Grantee reasonable prior written notice of the necessary repair. If GRANTOR gives such notice, and Grantee does not initiate immediate action to pursue to completion such repair with diligence, GRANTOR may, but shall not be obligated to, undertake that repair, all costs of which shall be immediately due and payable by Grantee on GRANTOR'S demand. This Section 5.04 is for the sole purpose of providing a mechanism for GRANTOR to respond to a situation in which immediate action is required to protect the State and/or public interest and such immediate action has not been initiated by or on behalf of Grantee.

5.05. Grantee shall not use, or permit the use of the Premises for any illegal purpose. Grantee shall comply, and will cause its officers, employees, agents, contractors and invitees to comply, with all applicable laws, ordinances, rules, and regulations of governing agencies concerning use of the Premises.

5.06. Failure by Grantee to construct, maintain and operate the Improvements in accordance with this Article V may render such Improvements "unauthorized structures" as defined under TEX. NAT. RES. CODE §51.302 and subject them to sanctions provided therein.

#### ARTICLE VI. ASSIGNMENTS

6.01. A. Grantee shall not assign the premises or the rights granted herein, in whole or part, to any third party for any purpose without prior written consent of the GRANTOR, which consent may not be unreasonably withheld. For purposes of this Section 6.01 A, the phrase "third party" shall not include any subsidiary or affiliate in which Grantee owns, respectively, at least a majority percentage, or the largest plurality percentage, voting interest.

B. Grantee may assign this Agreement without GRANTOR'S consent to (a) a parent entity, (b) any affiliate of Grantee controlled by the same parent entity, or (c) any subsidiary or affiliate in which Grantee owns, respectively, at least a majority percentage, or the largest plurality percentage, voting interest, provided that, in any of the foregoing events, (i) the resulting entity agrees in writing to assume and perform all of the terms and conditions of this Agreement, and (ii) Grantee provides notice to GRANTOR of any such assignment within thirty (30) days of such assignment. In the event of such assignment, it is understood and agreed by both Grantee and GRANTOR that the original Grantee remains liable to GRANTOR under all terms and provisions of the Agreement.

C. Any assignment which fails to comply with the foregoing provisions shall be void and of no effect.

D. This provision and the prohibition against unauthorized assignments contained herein shall survive expiration or earlier termination of this Agreement. For purposes of this Agreement, an assignment is any transfer, including by operation of law, to another of all or part of the property, interest or rights herein granted.

#### ARTICLE VII. PROTECTION OF NATURAL AND HISTORICAL RESOURCES

7.01. With regard to all activities authorized herein, Grantee shall use all reasonable best efforts to: (i) prevent pollution of air, ground, and water in and around the Premises, and (ii) to protect and preserve natural resources and wildlife habitat. Grantee shall comply with all applicable rules and regulations of the General Land Office and other governmental agencies responsible for the protection and preservation of public lands and waters, natural resources, and wildlife habitat. In the event of a pipeline incident that is reportable to the U.S. Department of Transportation, the General Land Office, or the Railroad Commission of Texas (or any other applicable regulatory agency) that may result in pollution of the Premises or adjacent property, Grantee shall notify the GRANTOR immediately upon discovery of such incident, use all means reasonably available to recapture any pollutants which have escaped or may escape, and mitigate for any and all natural resource damages caused thereby.

7.02. GRANTEE IS HEREBY EXPRESSLY NOTIFIED OF THE NATIONAL HISTORICAL PRESERVATION ACT OF 1966, (PB-89-66, 80 STAT. 915, 16 U.S.C.A. SECTION 470, *ET SEQ.*) AND THE ANTIQUITIES CODE, [TITLE 9, CHAPTER 191, TEX. NAT. RES. CODE]. IN CONFORMANCE WITH THESE LAWS, IN THE EVENT THAT ANY SITE, FOUNDATION, BUILDING, STRUCTURE, LOCATION, OBJECT, ARTIFACT, ITEM OR OTHER FEATURE OF ARCHEOLOGICAL, SCIENTIFIC, EDUCATIONAL, CULTURAL OR HISTORIC INTEREST IS ENCOUNTERED DURING THE ACTIVITIES AUTHORIZED BY THIS EASEMENT, GRANTEE SHALL IMMEDIATELY CEASE ANY AND ALL ACTIVITIES, AND NOTIFY THE COMMISSIONER OF THE GENERAL LAND OFFICE AND THE TEXAS HISTORICAL COMMISSION, PO BOX 12276, AUSTIN, TEXAS 78711, SO THAT APPROPRIATE ACTION MAY BE UNDERTAKEN TO PROTECT OR RECOVER SUCH DISCOVERIES OR FINDINGS, AS APPROPRIATE. IN THE EVENT THAT GRANTEE IS REQUIRED TO CEASE ACTIVITIES, THE GRANTOR SHALL NOT BE LIABLE FOR ANY COSTS OF GRANTEE, GRANTEE'S AGENTS, EMPLOYEES, CONTRACTORS, SUBCONTRACTORS OR ANY OTHER PERSON OR ENTITY AS A RESULT OF ANY INTERRUPTION OF GRANTEE'S ACTIVITIES OR INABILITY TO USE THE PREMISES AS HEREIN CONTEMPLATED.

#### ARTICLE VIII. INDEMNITY

8.01. GRANTEE SHALL BE FULLY LIABLE AND RESPONSIBLE FOR ANY DAMAGE, OF ANY NATURE, ARISING OR RESULTING FROM OR ATTRIBUTABLE TO GRANTEE'S USE GRANTED HEREIN OR THE ACTS OR OMISSIONS OF GRANTEE, ITS AGENTS OR CONTRACTORS RELATED TO GRANTEE'S EXERCISE OF



THE RIGHTS GRANTED HEREIN. GRANTEE AGREES TO AND SHALL INDEMNIFY AND HOLD THE GRANTOR, THE GRANTOR'S OFFICERS, AGENTS, AND EMPLOYEES, HARMLESS FROM AND AGAINST CLAIMS, SUIT, COSTS, LIABILITY OR DAMAGES OF ANY KIND, INCLUDING STRICT LIABILITY CLAIMS, COSTS OF COURT, ATTORNEY'S FEES AND COSTS OF INVESTIGATION OR EXPERTS, WITHOUT LIMIT AND WITHOUT REGARD TO CAUSE OF THE DAMAGE OR THE NEGLIGENCE OF ANY PARTY, (EXCEPT TO THE EXTENT OF THE PROPORTIONATE NEGLIGENCE OR WILLFUL MISCONDUCT OF THE GRANTOR, THE GRANTOR'S OFFICERS, AGENTS, EMPLOYEES, OR CONTRACTORS) ARISING DIRECTLY OR INDIRECTLY FROM OR ATTRIBUTABLE TO GRANTEE'S USE OF THE PREMISES (INCLUDING ANY ADJACENT OR CONTIGUOUS LAND) OR FROM ANY BREACH BY GRANTEE OF THE TERMS, COVENANTS OR CONDITIONS CONTAINED HEREIN. THE PROVISIONS OF THIS SECTION SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS AGREEMENT.

#### ARTICLE IX. DEFAULT, TERMINATION AND EXPIRATION

9.01 If, within thirty (30) days after receipt of written notice from the GRANTOR specifying an act of default or breach, Grantee fails to pay any money due hereunder or continues in breach of any term or condition of this Agreement, the GRANTOR shall have the right to terminate this Agreement and all rights inuring to Grantee herein. Should Grantee fail to cure the specified default or breach within the allowed thirty (30) day period, this Agreement shall be subject to termination, and upon such termination all rights granted herein to Grantee shall revert to the GRANTOR. Such termination shall not prejudice the rights of the GRANTOR to collect any money due or to seek recovery on any claim arising hereunder.

9.02. Except as otherwise provided by applicable law or rule and subject to obtaining necessary approval from state or federal agencies having applicable jurisdiction, or making best efforts to obtain such permits, Grantee shall, within one hundred twenty (120) days from the date of expiration or sooner termination of this Agreement, initiate removal of all personal property, structures, and the Improvements, and shall restore the Premises (and any other property affected by such removal activities) to the same condition that existed before Grantee entered thereon. Such removal and restoration activities shall be coordinated with the General Land Office in accordance with guidelines in effect at the time of removal/restoration which may include, without limitation, specific removal techniques required for protection of natural resources and mitigation or payment in lieu of mitigation for any and all damages resulting from removal activities, all of which shall be in accordance with generally accepted current pipeline industry standards using available technology. Grantee shall notify the GRANTOR at least ten (10) days before commencing removal/restoration activities so that a General Land Office field inspector may be present.

#### ARTICLE X. NOTICE

10.01. Any notice which may or shall be given under the terms of this Agreement shall be in writing and shall be either delivered by hand, by facsimile, or sent by United States first class mail, adequate postage prepaid, if for the GRANTOR to the Director of the Permanent School Fund Income Division, addressed to 1700 North Congress Avenue, Austin, Texas 78701-1495, FAX: (512) 463-5304, and if for Grantee, to it at 3630 FM 1765, Texas City, TX 77591-4824. Any party's address may be changed from time to time by such party by giving notice as provided above, except that the Premises may not be used by Grantee as the sole notice address. No change of address of either party shall be binding on the other party until notice of such change of address is given as herein provided.

10.02. For purposes of the calculation of various time periods referred to in this Agreement, notice delivered by hand shall be deemed received when delivered to the place for giving notice to a party referred to above. Notice mailed in the manner provided above shall be deemed completed upon the earlier to occur of (i) actual receipt as indicated on the signed return receipt, or (ii) three (3) days after posting as herein provided.

#### ARTICLE XI. INFORMATIONAL REQUIREMENTS

11.01. A. For newly constructed pipelines, Grantee shall submit to the GRANTOR, within one hundred eighty (180) days following installation or construction of the Improvements authorized in this Agreement, an "as-built" survey



and field notes prepared by a surveyor duly licensed by the State of Texas. The as-built survey shall be conducted in accordance with the GRANTOR'S survey requirements attached hereto as Exhibit C. Failure or refusal by Grantee to timely provide the as-built survey when due hereunder and the continuance of such failure for thirty (30) consecutive days after the receipt of the GRANTOR'S written notice to Grantee specifying such failure may be treated as a default by Grantee hereunder and the GRANTOR may, in addition to any other remedy and in the GRANTOR'S sole discretion, terminate this Agreement and require removal of any personal property and the Improvements located on the Premises in accordance with Section 9.02 of this Agreement.

B. Upon receipt of the as-built survey, prepared in accordance with this Section 11.01, the GRANTOR shall compare the as-built survey with the proposed location of the Improvements, as represented by Grantee's application to the GRANTOR and set forth in Section 2.01 (and referenced Exhibits) hereof. If there are changes or discrepancies in the location of the Improvements authorized by this Agreement, the GRANTOR may either terminate this Agreement, or: (i) upon determination that the changed location results in unacceptable adverse impacts, require relocation of the Improvements to conform to the authorized right of way, or (ii) upon determination of no unacceptable adverse impacts, agree to replace Exhibit B attached hereto with a substitute exhibit denoted as Exhibit B-1. The substitute exhibit shall be consistent with the as-built survey and signed by both parties. Upon attachment of Exhibit B-1 hereto, Exhibit B shall be void and of no further effect.

C. If all or any part of the Improvements are buried, Grantee shall submit to the GRANTOR, within one hundred eighty (180) days following installation or construction of the Improvements, a survey which includes coordinates, or at GRANTOR'S option, "depth of cover" data, prepared by a surveyor duly licensed by the State of Texas. The survey shall be conducted in accordance with the GRANTOR'S survey requirements attached hereto as Exhibit C. Failure or refusal by Grantee to timely provide the survey when due hereunder and the continuance of such failure for thirty (30) consecutive days after the receipt of the GRANTOR'S written notice to Grantee specifying such failure may be treated as a default by Grantee hereunder and the GRANTOR may, in addition to any other remedy and in the GRANTOR'S sole discretion, terminate this Agreement and require removal of any personal property and the Improvements located on the Premises in accordance with Section 9.02 of this Agreement.

11.02. A. Grantee shall provide written notice to the GRANTOR of any change in Grantee's name, address, or legal status (from a corporate entity to a partnership, etc.) and any change to other information required by this Agreement within thirty (30) days of the effective date of the change.

B. Grantee shall provide to the GRANTOR any other information reasonably requested by the GRANTOR in writing within thirty (30) days following such request.

C. If any information required to be submitted within a certain time under the terms of this Agreement shall not be received by the GRANTOR on or before ten (10) days after the date when due, after notice to Grantee and opportunity to cure, then, at GRANTOR'S discretion, Grantee may be required to pay the GRANTOR a "Late Charge" not to exceed One Hundred Dollars (\$100.00) for each day so past due until the date on which the information is received or the Agreement is terminated.

11.03. Except with regard to initial construction/installation of the Improvements and emergencies, prior to conducting any activities at the Premises which may materially impact natural resources in or around the Premises, Grantee shall provide written notice to the GRANTOR describing the proposed activities in detail and any procedures which will be used to protect natural resources. Such notice shall be provided by Grantee to the GRANTOR at least sixty (60) days prior to conducting re-burial activities, and at least thirty (30) days prior to conducting major repairs, modification, or other activities. Grantee acknowledges and agrees that the GRANTOR shall have at least twenty (20) days following receipt of the notice to review the proposed activities and to impose specific conditions for conducting such activities which, in the GRANTOR'S sole determination, are necessary to protect natural resources or to mitigate for actual damages to natural resources. If the GRANTOR has not provided notice to Grantee within twenty (20) days following receipt of Grantee's notice, the GRANTOR is deemed to have approved, subject to the terms of this Agreement, the proposed activities to be conducted at the Premises. In case of emergencies, Grantee



may undertake all actions necessary to prevent imminent injury or damage to public health, safety or welfare, and/or to protect natural resources, and Grantee shall undertake any such actions as are, in the pipeline industry, ordinary and commercially reasonable responses to such emergencies. Within twenty-four (24) hours following such emergency actions, Grantee shall provide notice to the GRANTOR of such actions as hereinabove provided.

## ARTICLE XII. MISCELLANEOUS PROVISIONS

12.01. With respect to terminology in this Agreement, each number (singular or plural) shall include all numbers, and each gender (male, female or neuter) shall include all genders. If any provision of this Agreement shall ever be held to be invalid or unenforceable, such invalidity or unenforceability shall not affect any other provisions of the Agreement, but such other provisions shall continue in full force and effect.

12.02. The titles of the Articles in this Agreement shall have no effect and shall neither limit nor amplify the provisions of the Agreement itself. This Agreement shall be binding upon and shall accrue to the benefit of the GRANTOR, its successors and assigns, Grantee, Grantee's successors and assigns (or heirs, executors, administrators and assigns, as the case may be); however, this clause does not constitute a consent by the GRANTOR to any assignment by Grantee, but instead refers only to those instances in which an assignment is hereafter made in strict compliance with Article VI above, or in the case of a deceased natural person grantee, refers to the instances previously referred to in this sentence and also circumstances in which title to Grantee's interest under this Agreement passes, after the demise of Grantee, pursuant to Grantee's will or the laws of intestate succession. The words "hereof," "herein," "hereunder," "hereinafter" and the like refer to this entire instrument, not just to the specific article, section or paragraph in which such words appear.

12.03. Neither tender nor acceptance of any sums payable hereunder nor failure by either party to complain of any action, non-action or default of the other shall constitute a waiver as to any breach of any covenant or condition contained herein nor a waiver of any of the rights hereunder. Waiver by the GRANTOR of any right for any default of Grantee shall not constitute a waiver of any right for either a prior or subsequent default of the same obligation or for any prior or subsequent default of any other obligation. No right or remedy of either party hereunder or covenant, duty or obligation hereunder shall be deemed waived by the other party unless such waiver be in writing, signed by a duly authorized representative of the party.

12.04. No provision of this Agreement shall be construed in such a way as to constitute the GRANTOR and Grantee joint venturers or co-partners or to make Grantee the agent of the GRANTOR or make the GRANTOR liable for the debts of Grantee.

12.05. In all instances where Grantee is required hereunder to pay any sum or do any act at a particular indicated time or within an indicated period, it is understood that time is of the essence.

12.06. The terms of this Agreement shall only be binding on the GRANTOR during the period of its ownership of the Premises, and in the event of the transfer of such ownership interest, the GRANTOR shall thereupon be released and discharged from all covenants and obligations thereafter accruing, but such covenants and obligations shall be binding during the Agreement term upon each new owner for the duration of such owner's ownership.

12.07. All monetary obligations of the GRANTOR and Grantee (including, without limitation, any monetary obligation for damages for any breach of the respective covenants, duties or obligations of either party hereunder) are performable exclusively in Austin, Travis County, Texas.

12.08. The obligation of Grantee to pay all Consideration and other sums hereunder provided to be paid by Grantee and the obligation of Grantee to perform Grantee's other covenants and duties under this Agreement constitute independent, unconditional obligations to be performed at all times provided for hereunder, save and except only when an abatement thereof or reduction therein is expressly provided for in this Agreement and not otherwise. Grantee waives and relinquishes all rights which Grantee might have to claim any nature of lien against, or withhold

or deduct from or offset against, any Consideration or other sums provided hereunder to be paid to the GRANTOR by Grantee. Grantee waives and relinquishes any right to assert, either as a claim or as a defense, that the GRANTOR is bound to perform or is liable for the nonperformance of any implied covenant or implied duty of the GRANTOR not expressly set forth in this Agreement.

12.09. Subject in all respects to Section 12.01 of this Agreement, this Agreement is and shall be subject to any applicable federal or state law, rule, order, or regulation presently or hereafter enacted or adopted to the extent, but only to the extent, that such law, rule, order, or regulation preempts or supersedes GRANTOR'S authority to issue this Agreement or to require any particular obligation of Grantee, provided, however, that in the event of a conflict between any provision of this Agreement and any administrative rule promulgated by the General Land Office and/or the School Land Board, this Agreement shall control.

#### ARTICLE XIII. RECORDING

13.01. Grantee shall, at its sole cost and expense, record this Agreement in the Fort Bend County Real Property Records and provide a file marked copy to the GRANTOR within 60 days after the recorded original of this Agreement is returned by the county clerk responsible for such records.

#### ARTICLE XIV. ENTIRE AGREEMENT

14.01. This instrument, including exhibits, constitutes the entire agreement between the GRANTOR and Grantee and no prior written, or prior or contemporaneous oral promises, warranties or representations shall be binding. This Agreement shall not be amended, changed, altered, or extended except by written instrument signed by all parties hereto.

14.02. This Agreement shall become effective only upon execution by all parties hereto and delivery of a fully executed counterpart to each party.

[Remainder of the page left intentionally blank]



IN TESTIMONY WHEREOF, witness our hands and the seal of the General Land Office.

GRANTOR: THE STATE OF TEXAS

By: \_\_\_\_\_

DocuSigned by:  
G.P. Bush  
84087346991253

GEORGE P. BUSH

Commissioner, General Land Office

Date: \_\_\_\_\_

12/31/2015

APPROVED:

Contents: \_\_\_\_\_

Legal: \_\_\_\_\_

Director: \_\_\_\_\_

Executive: \_\_\_\_\_

GRANTEE: GULF COAST WATER AUTHORITY

By: Ivan Langford III

Ivan Langford, III

(Printed Name)

Title: General Manager

Date: 12/8/2015

ACKNOWLEDGMENT FOR GRANTEE

STATE OF TEXAS §

COUNTY OF GALVESTON §

This instrument was acknowledged before me on the 8<sup>th</sup> day of December, 20 15,

by Ivan Langford III

(Grantee representative signing this document)



Karen E. Ivey  
(Notary Signature)

Notary Public, State of TEXAS

My commission expires: 12/31/2019

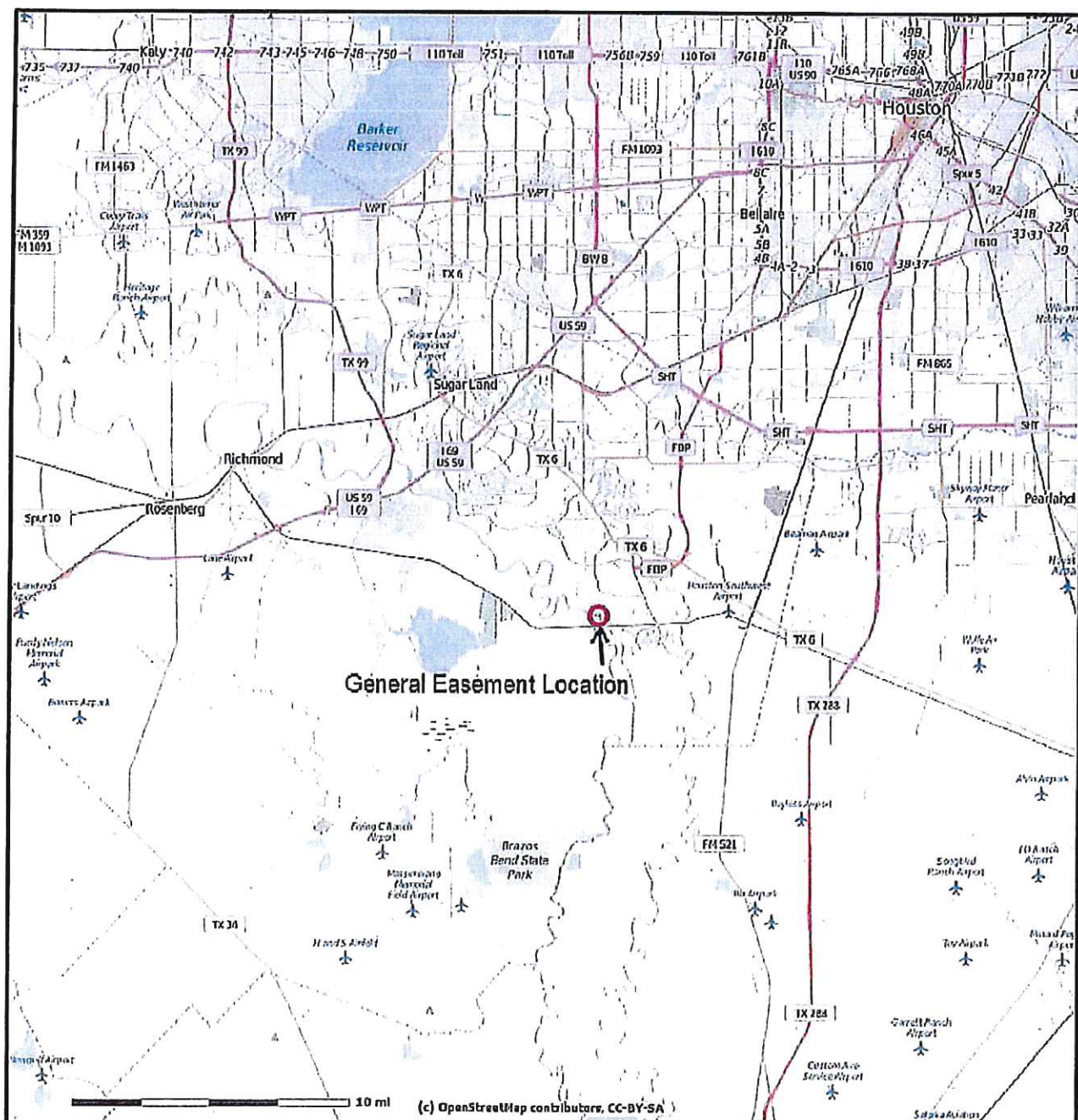


## VICINITY MAP

Exhibit A  
ME950014

*Brazos River, Fort Bend County, Texas*

RECORDER'S MEMORANDUM  
This page is not satisfactory for photographic recordation due to carbon or photo copy, discolored paper, etc. All block-outs, additions and changes were presented at time instrument was filed and recorded.



Printed: Nov 25, 2015

Inspection Date:



The Texas General Land Office makes no representations or warranties regarding the accuracy or completeness of the information depicted on this map or the data from which it was produced. This map is NOT suitable for navigational purposes and does not purport to depict or establish boundaries between private and public land.



SURVEY MAP

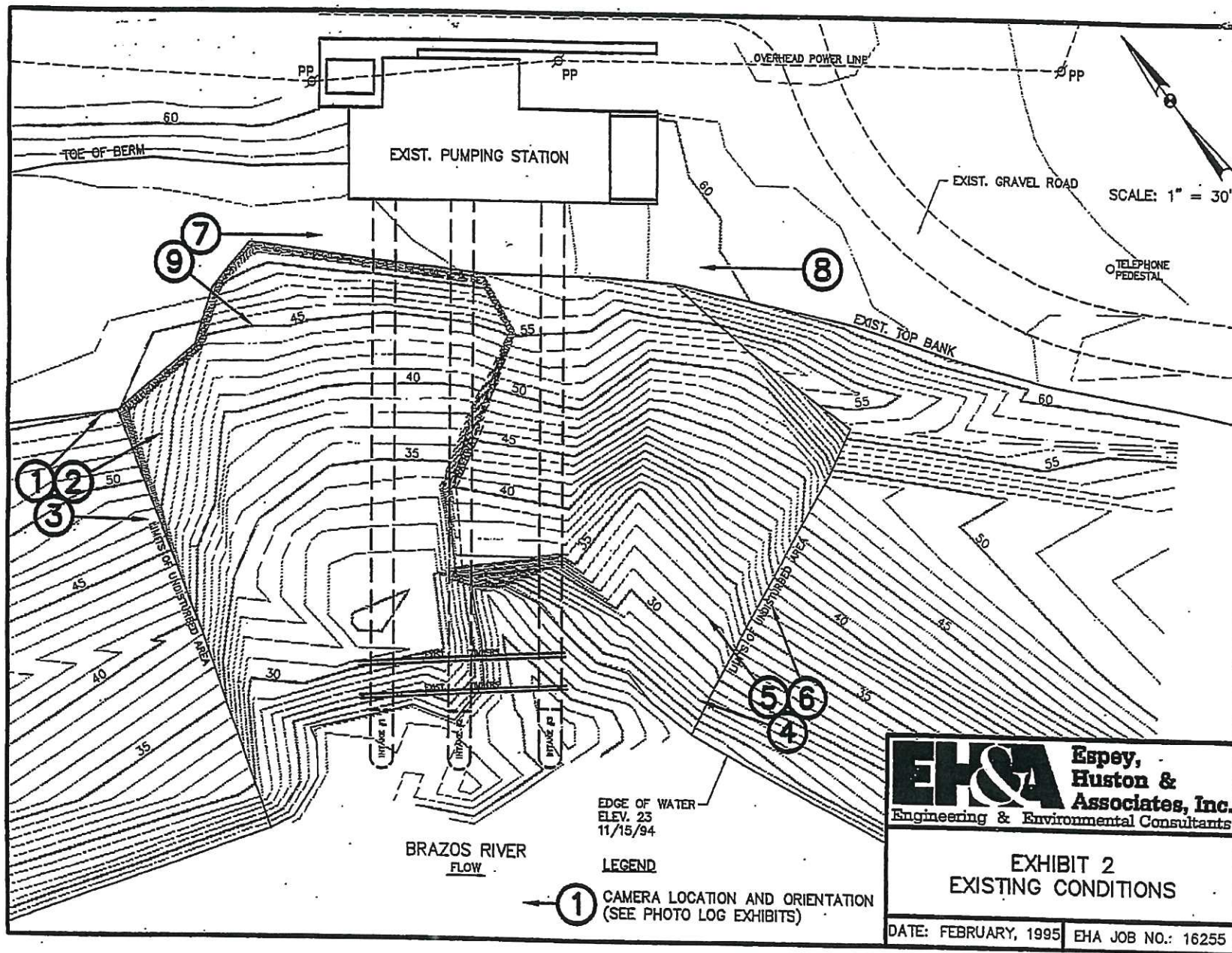




Exhibit C  
ME950014

## Instructions For Preparing Exhibits For the Following General Land Office Applications:

### Miscellaneous Easements (Pipeline)

Maps (or plats) showing the location of proposed and as-built projects on state-owned lands are required as part of the General Land Office (GLO) application process. The following instructions are to be followed when applying for new work (proposed project), or for reporting as-built conditions for a previously approved project, when the activity is a Miscellaneous Easement (Pipeline/Right-of-Way) on state land.

The information specified below represents minimum requirements of the GLO; additional information may be requested on a project-by-project basis to facilitate a full evaluation of the proposed activity.

The information should be submitted along with the required application form and processing fees. Each map or plat must conform to the specifications contained herein. An application is not considered complete, and processing of the application will not be initiated, until all information requested has been submitted and GLO staff has determined that it is adequate.

NOTE: Surveys and survey plats required by other entities, Federal, State, County and/or City, are PERMISSIBLE and USABLE for GLO applications provided they meet the following requirements.

### **IF SUBMITTING SURVEY PLATS DIGITALLY, PLEASE PROVIDE THE INFORMATION IN ONE OF THE FOLLOWING FORMATS:**

- 1. In an ESRI format (i.e. Shape file, E00, or Geodatabase)**
- 2. AutoDesk Map 6 or earlier version in a DWG format.**
- 3. And Projection Information of the data set submitted.**

### **A. GENERAL INSTRUCTIONS FOR ALL APPLICATIONS:**

1. Each map or plat should be 8-1/2" x 11".
2. A one-inch margin should be left at the top edge of each sheet for binding purposes.
3. Any shading used to identify specific areas must be reproducible by ordinary copy machines.
4. Each map or plat submitted must have a title block identifying, at a minimum: (a) applicant name; (b) applicant address; (c) project name; (d) date of preparation; (e) name of preparer, and (f) project location as follows:
  - (1) if on state-owned uplands, then provide county, survey name (original grantee) and, as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number;
  - (2) if on submerged land, then provide county name, waterbody name, and state tract number.
5. The scale for each map or plat must be clearly indicated both digitally and by graphic scale.
6. **Vicinity Map** -- Exhibit A for each project application must be a Vicinity Map showing the general location of the proposed work. The Vicinity Map must be produced using a U.S.G.S. 7.5-minute topographic map, a Texas Department of Transportation County Road Map, or navigation chart as its base layer. The project location should be indicated by a prominent arrow on the map. An 8 1/2" x 11" Xerox copy from the original Topo, county map, or navigation chart showing the project location is sufficient. It is not necessary to submit the entire Topo or county map, so long as the map is appropriately identified as to the origin of the base information (e.g., name, and date of base map information used). This is most easily accomplished by copying the legend of the base map and making it part of the Vicinity Map.

7. Project Site Map -- Exhibit B for each project application should be a Project Site Map (in Survey Plat format) which provides specific project location information. The Project Site Map should be produced at sufficient scale and detail to enable field inspectors to locate the project on the ground with minimal difficulty. Demographic features such as road numbers, stream names, railroad crossings, corporate city limits, and other prominent locative features should be included on the Project Site Map. The project location should be indicated by a prominent arrow on the map and a North arrow must be provided. Annotation may be included on the map regarding distance of the project from known points (e.g., highway intersections, road stream crossings, etc.). Additional requirements for preparing Project Site Maps are provided in Section B of this document.

8. Detailed Project Plan if available -- Exhibit C for each project application should be a Detailed Project Plan, consisting of an aerial plan-view drawing and a cross-sectional drawing of all proposed or existing structures on state-owned lands at the project site.

Page 1 of the Detailed Project Plan should contain, at a minimum:

- a. Location of the shoreline or banks if the project is on or adjacent to tidally influenced waters or crosses a state-owned river, stream, creek, or bayou.
- b. The direction of ebb and flow if in or adjacent to tidal waters, or the direction of water flow if the project crosses a river, creek, stream, or bayou.
- c. A North arrow.
- d. The location of state tract lines (on tidally influenced lands), survey lines, or property lines, as applicable.
- e. The location of any marshes, submerged grass flats, oyster reefs, mud or sand flats, or other sensitive natural/cultural resources known to exist in the project area.
- f. The lines of mean high water and mean low water when applicable.
- g. The Detailed Project Plan cross-sectional drawing must include notation as to the outside diameter (OD) of all pipelines covered by the easement, and the relationship of the pipeline(s) to any other pipeline(s) in the immediate vicinity.
- h. The registration, easement, or lease numbers for any structures at the site previously authorized by the GLO (available from GLO field offices upon request).
- i. Any applicable Corps of Engineers application numbers covering the proposed work, as soon as that application number is available, but, in any event, prior to issuance of the easement.

Page 2 of the Detailed Project Plan should contain, as applicable, an explanation of construction methodology, techniques, and equipment that will be used at the site.

9. As-Built Survey -- A survey showing the depth of burial must be furnished for all projects on state-owned tidally influenced lands (Gulf of Mexico, bays, estuaries, etc.), crossings of state-owned rivers/streams/creeks/bayous. The survey shall show plan view only for projects on state-owned upland tracts. Failure to provide this information is, by terms of the state contract, grounds for termination of the easement and removal of the structure from state-owned land.

**New Pipeline Installations:** Each application for installation of a new pipeline must include with the application a profile drawing showing the proposed depth of burial at not less than 36" below the surface.

GLO will issue an easement using the proposed ROW and depth of burial information. Following installation of the pipeline, however, the applicant is required by terms of the GLO contract to provide a survey of actual burial depth measurements for that portion of the ROW length occupying state-owned land. The spacing between depth-of-burial measurement points is a function of the length of ROW. If the easement length is less than 500 feet, the depth of cover of the structure and waterway bottom elevation shall be determined at intervals not to exceed 50 feet. If the easement length is greater than 500 feet but less than 5,000 feet the interval between measurement points shall be 100 feet. Easements greater than 5,000 feet in length shall be surveyed at 250-foot intervals.

All work shall be performed under the supervision of, and sealed by, a registered professional land surveyor. All submitted drawings must be sealed by the supervising registered public land surveyor. All elevations must be referenced to a common datum (Mean Sea Level, National Geodetic Vertical Datum, Mean Low Water, etc.) and grid coordinates must reference Texas State Plane coordinate System of 1927 or 1983. The accuracy of the waterway bottom and pipeline elevations shall be +/- one-half (.5') foot for the waterway bottom and +/- one-half (0.5') foot for depth of burial less than or equal to 10 feet and +/- fifteen (15%) percent for depth of burial greater than ten (10) feet. Manual probing and electronic means (both active and passive) of survey type shall be acceptable for depth of burial determinations.

**Existing Pipelines:** At time of renewal of a contract for an existing underground pipeline easement, provide the data as required under Section 3.02.(iv) of this easement contract.



**CERTIFICATION BY A TEXAS REGISTERED PUBLIC LAND SURVEYOR IS REQUIRED ON ALL OF THE FOLLOWING WITH THE EXCEPTION OF DIRECTIONALLY DRILLED WELL BORE LOGS.**

**B. SPECIFIC INSTRUCTIONS:**

Maps or Survey Plats to be submitted as the Project Site Map and/or the Detailed Project Plan (see A7 and 8 above) must contain the information described below.

Upland survey data should be reported to normal boundary land surveying minimum standards. Offshore or submerged sites shall be located to a specified accuracy of +/- 5 feet of any reported location.

**1. Projects located on Tidally Influenced State-owned lands (Including the Gulf of Mexico, bay tracts, and the tidally influenced portions of rivers, creeks, streams, and bayous):**

Coordinates must be provided at the beginning and ending points of the Rights-of-Way (ROWs) centerline, or on the principal point or points of tracts described by other means (directional well bores, etc.). These coordinates must be based on the Texas State Plane Coordinate System of 1927 or 1983. Courses and distances must be specified as either grid or geodetic for all centerlines and perimeter lines, and ties must be made from specific improvements (e.g., well heads, platforms, pilings, etc.) to a corner or corners of the lease or easement tract. All submerged state land tracts crossed by any part of the ROW must be shown and identified, and the points of each ROW crossing of a state-tract boundary identified in the Texas State Plane Coordinate System of 1927 or 1983. The distance between crossings of a state-tract boundary must be indicated in both feet and rods on the plat.

As-built plats (and confirmation surveys at time of renewal) must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the ROW, the plat shall provide a minimum of one identified point for each 1,000 feet of ROW length. A ROW less than 1,000 feet long but greater than 500 feet in length requires one mid-point to be identified on the survey plat.

**2. Projects Across State-owned Upland Property, or the state-owned portion of a river, creek, stream, or bayou above the limit of tidal influence:**

**a. Upland Tract (State Fee Lands):**

For new project applications, information provided for projects on state-owned upland tracts shall include the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the proposed easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with the survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the easement.

At completion of construction, or at time of renewal, an as-built plat or confirmation survey (whichever is applicable) must be submitted. This plat must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the easement route, the plat shall provide a minimum of one identified point for each 1,000 feet of length. For easement routes, fewer than 1,000 feet long but greater than 500 feet long, one mid-point shall be identified on the survey plat.

**b. Crossing the State-owned portion of a river, creek, stream, or bayou above the limit of tidal influence.**

Information provided for projects crossing non-tidal state-owned rivers, creeks, streams, or bayous shall include an identification of the stream or water body by local and any other names known (historic, from topographic or other maps, etc.). In addition, the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with a cross section or profile of the crossing between the top of the high banks, survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the easement.

RETURN TO:

GULF COAST WATER AUTHORITY  
3630 FM 1765  
TEXAS CITY TEXAS 77591

FILED AND RECORDED  
OFFICIAL PUBLIC RECORDS

*Laura Richard*

Laura Richard, County Clerk  
Fort Bend County, Texas

February 09, 2016 01:54:44 PM

FEE: \$79.00 SR1  
EASEMENT

2016013370

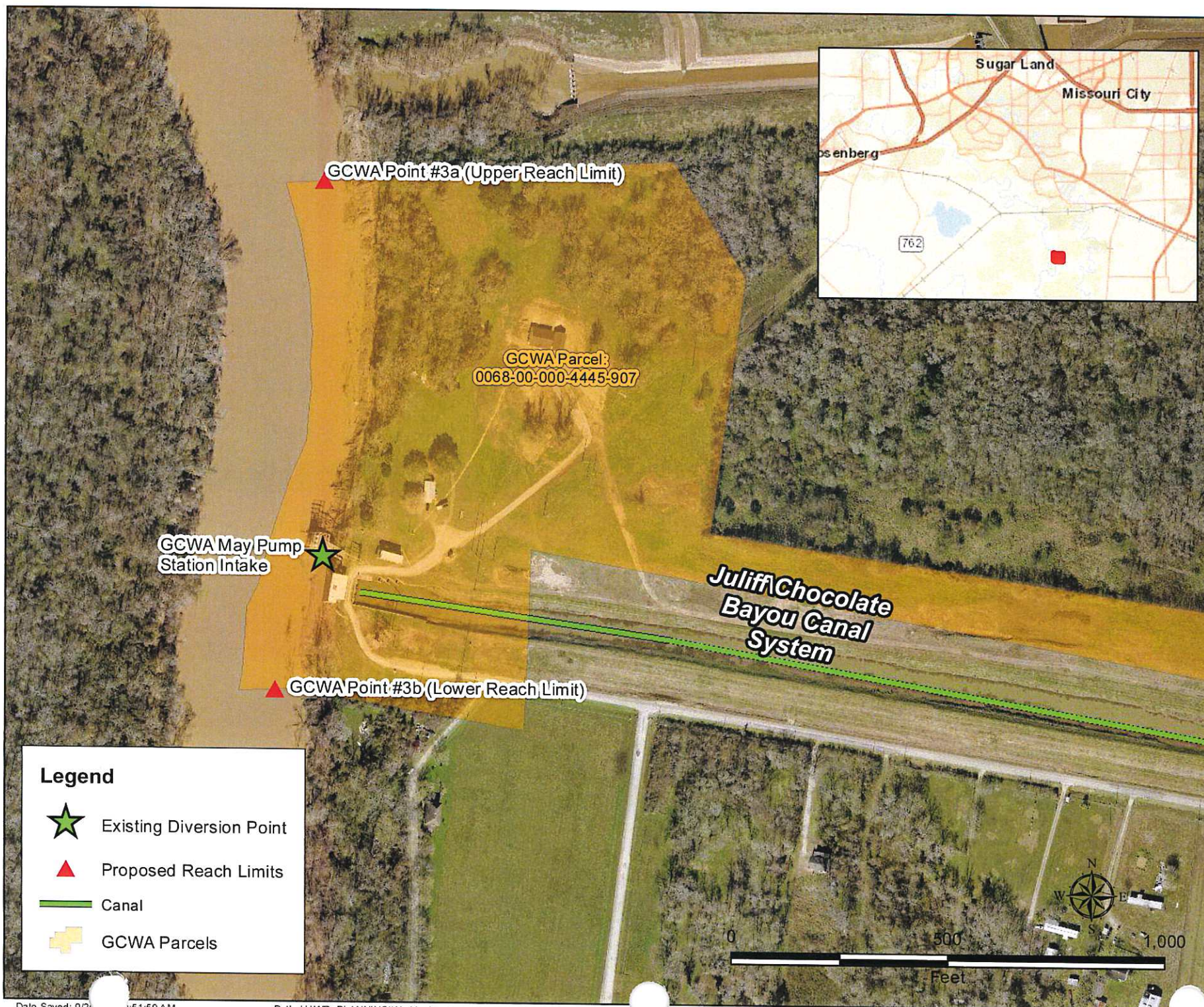




### **Attachment 5-3:**

Deed and Easement Information for GCWA Reach 3 (May  
Pump Station and Juliff Canal)







**Document 5-3(a)**

2006 Warranty Deeds

SPECIAL WARRANTY DEEDJS  
ce

THE STATE OF TEXAS                   §  
   § ss: KNOW ALL PERSONS BY THESE PRESENTS:  
 COUNTY OF BRAZORIA               §

**THAT IP Farms, Inc.** a Delaware corporation, whose address is c/o International Paper Company, 6775 Lenox Center Court, Memphis, Tennessee, 38115 (hereinafter referred to as "**Grantor**") in consideration of the sum of Ten Dollars (\$10) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by its acceptance of this deed, has granted, bargained, sold, and conveyed and by these presents does hereby grant, bargain, sell and convey unto **Chocolate Bayou Water Company**, a Delaware corporation, whose address is c/o International Paper Company, 6775 Lenox Center Court, Memphis, Tennessee (hereinafter referred to as "**Grantee**"), all of the real property, together with improvements, if any, situated, lying and being in the County of Brazoria, State of Texas as more particularly described as follows:

SEE EXHIBIT A ATTACHED HERETO AND MADE A PART HEREOF FOR ALL PURPOSES.

**TOGETHER** with all and singular the hereditaments and appurtenances thereto belonging, or in anywise appertaining, and all the estate, right, title and interest whatsoever of the Grantor either in law or in equity, of, in and to the above-described property ( the "**Property**").

Taxes for the current year shall be prorated to the Closing Date.

**TO HAVE AND TO HOLD** the Property unto Grantee, its successors and assigns, forever. The Grantor, for itself, its successors and assigns, does covenant and agree that it will WARRANT title to the Property to the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under Grantor, but not otherwise, subject (i) to the Permitted Encumbrances as set forth on Exhibit B attached hereto and (ii) all matters that a current survey or physical inspection of the Property would reveal.

**ANY COVENANTS OR WARRANTIES IMPLIED BY STATUTE OR LAW BY THE USE OF THE WORD "SELL," "ASSIGN," "TRANSFER," "CONVEY," OR OTHER WORDS OF GRANT ARE HEREBY EXPRESSLY WAIVED AND DISCLAIMED BY THE PARTIES. GRANTOR AND GRANTEE HEREBY AGREE THAT, TO THE EXTENT REQUIRED BY APPLICABLE LAW, THE DISCLAIMERS CONTAINED IN THIS ASSIGNMENT ARE "CONSPICUOUS" FOR THE PURPOSES OF SUCH APPLICABLE LAW, RULES, REGULATION OR ORDER.**



IN WITNESS WHEREOF, this instrument is executed this 13<sup>th</sup> day of December, 2006.

**GRANTOR:**

**IP FARMS, INC.**

By: Sabrina Finnegan  
Name: Sabrina Finnegan  
Title: Vice-President

THE STATE OF TEXAS

§  
§  
§

ss:

COUNTY OF HARRIS

The foregoing instrument was acknowledged before me this 13<sup>th</sup> day of December, 2006, by Sabrina Finnegan as Vice-President of IP Farms, Inc., a Delaware corporation.

Zoraida Agosto  
Notary Public

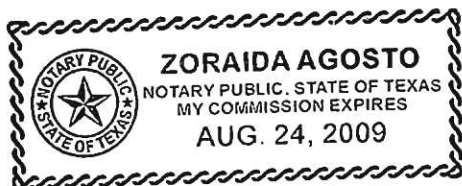


Exhibit A

FIELD NOTES OF A 7.82 ACRE TRACT OUT OF LOT 6 OF THE BOSLER SUBDIVISION OF THE JOSHUA ABBOTT SURVEY, ABSTRACT 144, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 1, PAGE 88 OF THE PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PORTION OF THAT SAME PROPERTY CONVEYED BY DEED DATED DECEMBER 15, 1948, FROM D.M. HAVLIC TO THE SOUTH TEXAS WATER COMPANY, RECORDED IN VOLUME 442, PAGE 442 THROUGH 444 OF THE DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND SAID 7.82 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at a 3/4" iron rod found marking the Northeast corner of Lot 7 of the Bosler Subdivision in the Joshua Abbott Survey;

THENCE; South 88°53'35" West 1536.19 feet, along the North line of said Lot 7, to a 3/4" iron rod found marking the Northwest corner of said Lot 7 and the Northeast corner of Lot 6 of the Bosler Subdivision;

THENCE; South 88°57'45" West 1354.28 feet, along the North line of said Lot 6, to a 1/2" iron rod set for the place of beginning of the herein described tract;

THENCE; South 0°15'56" West 2271.87 feet to a 1/2" iron rod set for corner in the North right-of-way line of County Road 49;

THENCE; South 88°55'55" West 115.00 feet, along the North right-of-way line of County Road 49, to a 1/2" iron rod set for corner at the Southwest corner of said Lot 6;

THENCE; North 1°30' West, at 2267.22 feet pass a 1/2" iron rod set on line along the West line of said Lot 6, continue to a total distance of 2271.42 feet to a point for corner at the Northwest corner of said Lot 6;

THENCE; North 88°57'45" East 185.00 feet, along the North line of said Lot 6, to the place of beginning.

Said tract therein containing 7.82 acres of land.

## Exhibit A

2.80 ACRES OF LAND BEING A PART OF THE C.M. HAYS SURVEY, ABSTRACT 533, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN 668.389 ACRE TRACT DESCRIBED IN A RELEASE OF SURFACE RIGHTS RECORDED IN VOLUME 1760, PAGE 488, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND ALSO BEING A PART OF THAT CERTAIN 166.707 ACRE TRACT DESCRIBED IN A SUBSTITUTE TRUSTEE DEED TO IP FARMS, INC. RECORDED IN VOLUME (88)541, PAGE 105, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS SAID 2.80 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 3/4 inch iron rod found for the Southeast corner of the herein described tract at the Southeast corner of said 166.707 acre tract and the Southeast corner of Abstract 533, the Northeast corner of Abstract 236, the Southwest corner of the A.A. Talmage Survey Section 42, Abstract 558, and the Northwest corner of the A.A. Talmage Survey Section 36, Abstract 555;

THENCE South 87 deg. 04 min. 03 sec. West, along the South line of said 166.707 acre tract and the South line of the C.M. Hays Survey, Abstract 533 and the North line of the H.T. & B. R.R. Company Survey, Abstract 236, and the North line of the Archer Lake Inc. tract described in Volume 515, Page 329, Deed Records, a distance of 42.25 feet to a 1 inch iron pipe set for corner;

THENCE North 05 deg. 59 min. 34 sec. West, along the West edge of a seep ditch, at 100.0 feet pass a 1 inch iron pipe set and continue for a total distance of 1497.88 feet to a 1 inch iron pipe set for corner;

THENCE North 87 deg. 31 min. East, along the North line of said 166.707 acre tract and the South line of the Chang tract a distance of 121.0 feet to a 3/4 inch iron rod found for the Northeast corner of the herein described tract at the Northeast corner of said 166.707 acre tract in the East line of Abstract 533 and the West line of Abstract 558;

THENCE South 02 deg. 58 min. 46 sec. East, along the East line of said 166.707 acre tract and the common line of said surveys a distance of 1494.80 feet to the PLACE OF BEGINNING and containing 2.80 acres of land.

## EXHIBIT B

### PERMITTED ENCUMBRANCES

1. Any liens for taxes and assessments not yet delinquent.
2. Any obligations or duties reserved to or vested in any municipality or other governmental authority to regulate the Property in any manner.
3. Mechanics, materialmen's and similar liens for amounts not yet delinquent.
4. Rights-of-way, easements, use restrictions, encroachments or other similar encumbrances affecting the Property which do not materially adversely affect the use of the Property for its intended purpose.

Doc# 2007040667  
# Pages 5  
07/17/2007 12:48PM  
Official Records of  
BRAZORIA COUNTY  
JOYCE HUDMAN  
COUNTY CLERK  
Fees \$32.00

*Joyce Hudman*





Doc# 2007047929

SPECIAL WARRANTY DEED

130 we

THE STATE OF TEXAS

§

§

ss: KNOW ALL PERSONS BY THESE PRESENTS:

§

COUNTY OF BRAZORIA

THAT **Chocolate Bayou Water Company**, a Delaware corporation, whose address is c/o International Paper Company, 6775 Lenox Center Court, Memphis, Tennessee, 38115 (hereinafter referred to as "**Grantor**") in consideration of the sum of Ten Dollars (\$10) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by its acceptance of this deed, has granted, bargained, sold, and conveyed and by these presents does hereby grant, bargain, sell and convey unto **Gulf Coast Water Authority**, a political subdivision of the State of Texas, whose address is 3630 Highway 1765, Texas City, Texas 77591 (hereinafter referred to as "**Grantee**"), all of the real property, together with improvements, if any, situated, lying and being in the County of Brazoria, State of Texas as more particularly described as follows:

SEE EXHIBIT A ATTACHED HERETO AND MADE A PART HEREOF FOR ALL PURPOSES.

**TOGETHER** with all and singular the hereditaments and appurtenances thereto belonging, or in anywise appertaining, and all the estate, right, title and interest whatsoever of the Grantor either in law or in equity, of, in and to the above-described property ( the "**Property**").

Taxes for the current year shall be prorated to the Closing Date.

**TO HAVE AND TO HOLD** the Property unto Grantee, its successors and assigns, forever. The Grantor, for itself, its successors and assigns, does covenant and agree that it will WARRANT title to the Property to the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under Grantor, but not otherwise, subject (i) to the Permitted Encumbrances as set forth on Exhibit B attached hereto and (ii) all matters that a current survey or physical inspection of the Property would reveal.

**ANY COVENANTS OR WARRANTIES IMPLIED BY STATUTE OR LAW BY THE USE OF THE WORD "SELL," "ASSIGN," "TRANSFER," "CONVEY," OR OTHER WORDS OF GRANT ARE HEREBY EXPRESSLY WAIVED AND DISCLAIMED BY THE PARTIES. GRANTOR AND GRANTEE HEREBY AGREE THAT, TO THE EXTENT REQUIRED BY APPLICABLE LAW, THE DISCLAIMERS CONTAINED IN THIS ASSIGNMENT ARE "CONSPICUOUS" FOR THE PURPOSES OF SUCH APPLICABLE LAW, RULES, REGULATION OR ORDER.**

IN WITNESS WHEREOF, this instrument is executed this 13<sup>th</sup> day of December, 2006.

**GRANTOR:**

**Chocolate Bayou Water Company**

By: Allen D. Moore

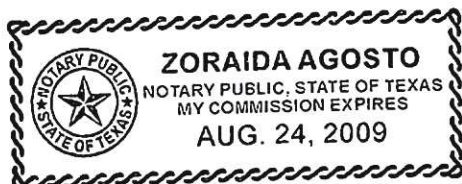
Name: ALLEN D. MOORE

Title: V-President

THE STATE OF TEXAS     §  
   §     ss:  
COUNTY OF HARRIS     §

The foregoing instrument was acknowledged before me this 13<sup>th</sup> day of December, 2006, by Allen D. Moore as Vice President of Chocolate Bayou Water Company, a Delaware corporation.

Zoraida Agosto  
Notary Public



**EXHIBIT "A"**

**TO**

**SPECIAL WARRANTY DEED**

**FROM**

**CHOCOLATE BAYOU WATER COMPANY ("GRANTOR")**

**TO**

**GULF COAST WATER AUTHORITY ("GRANTEE")**

**(Consisting of 17 Tracts of Land - each labeled Exhibit A)**

## EXHIBIT A

### Juliff Parcel 1

### FIELD NOTES

116.07 ACRES OF LAND, BEING A PART OF THE WILLIAM PETTUS LEAGUE, ABSTRACT 68, FORT BEND COUNTY, TEXAS, LYING WEST OF F. M. 521 AND EAST OF THE BRAZOS RIVER, AND BEING THAT CERTAIN TRACT DESCRIBED IN A DEED FROM A. M. MILLER TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 160, PAGE 411, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM J. D. EUBANK AND J. F. EUBANK TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 153, PAGE 399, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM J. F. EUBANK TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 209, PAGE 81, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM J. D. EUBANK AND J. F. EUBANK TO SOUTH TEXAS WATER COMPANY DATED FEBRUARY 10, 1941, AND DESCRIBED AS SAVE AND EXCEPT TRACT 2 IN VOLUME 209, PAGE 89, DEED RECORDS, SAID 116.07 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 2 inch iron pipe set for the Northeast corner of the herein described tract in the West right-of-way line of the Missouri-Pacific Railroad (abandoned) and the East line of the DMD Interests, LTD. 370.94 acre tract described in Clerk's File 980897, said point being the Northeast corner of the aforementioned Miller to South Texas Water Company tract, said point being located South 02 deg. 34 min. 33 sec. West - 2735.26 feet from a 3/4 inch iron pipe found at the intersection of the North line of the William Pettus League with the West right-of-way line of said railroad, which point is the Southeast corner of a 7454.008 acre tract described in Volume 951, Page 578, Deed Records, said Beginning Point having coordinates of

X = 3,121,386.58 and Y = 605,304.38;

THENCE South 02 deg. 34 min. 33 sec. West, along the West line of said railroad, a distance of 200.07 feet to a 2 inch iron pipe set for the Southeast corner of the herein described tract in the North right-of-way line of Miller Road, 80.0 feet wide as described in Volume 168, Page 72, Deed Records;

THENCE North 88 deg. 57 min. 11 sec. West, along the North line of Miller Road, a distance of 7224.95 feet to a 3/4 inch iron pipe set for angle point in the West right-of-way line of the abandoned Old Sugarland Railroad, said point being the Southeast corner of the aforementioned South Texas Water Company tract described in Volume 153, Page 399, Deed Records;

THENCE North 88 deg. 56 min. 12 sec. West, along the South line of said tract and the North line of Miller Road as described as Save and Except Tract 3 in Volume 209, Page 89, Deed Records, a distance of 465.01 feet to a 3/4 inch iron pipe set at the P.C. of a curve to the left;



THENCE continuing along the common line of said tracts, being the North line of Miller Road, following said curve to the left having a Radius = 1332.39 feet, Central Angle of 05 deg. 22 min. 45 sec., Chord Bearing and Distance of South 88 deg. 22 min. 26 sec. West - 125.04 feet, for an arc distance of 125.09 feet to a 3/4 inch iron pipe set at the P.T. of said curve;

THENCE South 85 deg. 41 min. 03 sec. West, along the common line of said tracts, being the North line of Miller Road, a distance of 3836.97 feet to a 3/4 inch iron pipe set at the P.C. of a curve to the right;

THENCE along the common line of said tracts, being the North line of Miller Road, following said curve to the right having a Radius = 1532.39 feet, Central Angle of 14 deg. 18 min. 58 sec., Chord Bearing and Distance of North 87 deg. 09 min. 28 sec. West - 381.89 feet, for an arc distance of 382.89 feet to a 3/4 inch iron pipe set at the P.T. of said curve;

THENCE North 79 deg. 59 min. 59 sec. West, along the common line of said tracts, being the North line of Miller Road, a distance of 5837.57 feet to a 3/4 inch iron pipe set for corner;

THENCE South 09 deg. 40 min. 01 sec. West, at 80.0 feet pass a 1/2 inch iron pipe found in the South line of Miller Road at the upper Northwest corner of the Shirley Strickland tract described in Volume 2270, Page 1540, Deed Records, and continue for a total distance of 146.88 feet to a 1/2 inch iron pipe found at an ell corner of the Strickland tract;

THENCE North 81 deg. 03 min. 13 sec. West, along a line of the Strickland tract, at 260.0 feet pass a 2 inch iron pipe set, and continue for a total distance of 304.70 feet to a point for corner on the Easterly bank of the Brazos River;

THENCE up the Easterly bank of the Brazos River the following courses and distances:

North 06 deg. 39 min. 47 sec. West - 187.73 feet,

North 13 deg. 18 min. 37 sec. East - 347.24 feet,

North 19 deg. 21 min. 25 sec. East - 140.37 feet,

North 05 deg. 15 min. 19 sec. East - 373.33 feet, and

North 04 deg. 46 min. 36 sec. West - 169.15 feet

to the Northwest corner of the herein described tract at the intersection of the North line of the Pettus League and the South line of the William Hall League, Abstract 31, with the East bank of the Brazos River;

THENCE North 86 deg. 50 min. 30 sec. East, along the common line of said Surveys, at 40.0 feet pass a 3/4 inch iron pipe found at the Southwest corner of the AFG Pacific Properties, Inc. 3927.662 acre tract described in Clerk's File 9537103, and continue along the South line of said tract for a total distance of 915.28 feet to a concrete monument found for corner at the Northwest corner of the AFG Pacific Properties, Inc. 305.661 acre tract described in Clerk's File 9562810;

THENCE South 09 deg. 59 min. 41 sec. West, along the West line of said 305.661 acre tract, a distance of 856.72 feet to a 5/8 inch iron rod found for corner;

THENCE South 80 deg. 00 min. 21 sec. East, along the South line of said 305.661 acre tract, a distance of 1499.78 feet to a 5/8 inch iron rod found for corner;

THENCE South 09 deg. 57 min. 38 sec. West, along a line of said tract, a distance of 169.99 feet to a 5/8 inch iron rod found for corner;

THENCE South 79 deg. 59 min. 59 sec. East, along the South line of said 305.661 acre tract, a distance of 3834.84 feet to a 5/8 inch iron rod found at the P.C. of a curve to the left;

THENCE continuing along the South line of said 305.661 acre tract, following said curve to the left having a Radius = 1302.39 feet, Central Angle of 14 deg. 18 min. 58 sec., Chord Bearing and Distance of South 87 deg. 09 min. 28 sec. East - 324.57 feet, for an arc distance of 325.42 feet to a 5/8 inch iron rod found at the P.T. of said curve;

THENCE North 85 deg. 41 min. 03 sec. East, along the South line of said 305.661 acre tract, a distance of 3836.97 feet to the P.C. of a curve to the right, from which point a 5/8 inch iron rod bears 0.50 feet Southwest;

THENCE along the South line of said 305.661 acre tract, following said curve to the right having a Radius = 1562.39 feet, Central Angle of 05 deg. 22 min. 45 sec., Chord Bearing and Distance of North 88 deg. 22 min. 26 sec. East - 146.63 feet, at 27.92 feet pass a concrete monument found, and continue for a total arc distance of 146.68 feet to a 5/8 inch iron rod found at the P.T. of said curve;

THENCE South 88 deg. 56 min. 12 sec. East, along the South line of said 305.661 acre tract, at 37.80 feet pass a concrete monument found, and continue for a total distance of 460.77 feet to a concrete monument found for corner in the West line of the Old Sugarland Railroad, being the Southeast corner of said 305.661 acre tract;

THENCE South 00 deg. 16 min. 45 sec. East, along the West line of said railroad and the West line of the DMD Interests, LTD. tract, a distance of 30.0 feet to a concrete monument found for corner, being the Northwest corner of the aforementioned Miller to South Texas Water Company tract;

THENCE South 88 deg. 57 min. 11 sec. East, along the North line of said tract, a distance of 7234.05 feet to the PLACE OF BEGINNING and containing 116.07 acres of land, of which 33.19 acres is included in the DMD Interests, LTD. 370.94 acre tract.

BEARING BASE: Texas State Plane Coordinate System - South Central Zone. Coordinates based on USGS "Missouri City Monument #7045" NAD 27. Distances are true ground distances. To convert to grid, multiply by 0.998868.

Juliff

EXHIBIT A

Juliff Parcel 2

FIELD NOTES

191.19 ACRES OF LAND, BEING A PART OF THE WILLIAM PETTUS LEAGUE, ABSTRACT 68, FORT BEND COUNTY, TEXAS, AND ABSTRACT 714, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THE EMIGRATION LAND COMPANY SUBDIVISION RECORDED IN VOLUME 618, PAGE 725, DEED RECORDS OF FORT BEND COUNTY, TEXAS AND A PART OF THE HOUSTON FIG ORCHARD SUBDIVISION RECORDED IN VOLUME 1, PAGE 69, PLAT RECORDS OF FORT BEND COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED FROM HUFFMAN TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 178, PAGE 333, DEED RECORDS, ALL OF THAT CERTAIN TRACT DESCRIBED IN A DEED FROM DIXON TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 444, PAGE 130, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM PHELPS TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 379, PAGE 621, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM TIGNER TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 160, PAGE 413, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM OLIVE TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 178, PAGE 332, DEED RECORDS, AND THAT CERTAIN TRACT DESCRIBED IN A DEED FROM WHEATLEY TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 160, PAGE 415, DEED RECORDS, SAID 191.19 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 5/8 inch iron rod found for the Northwest corner of the herein described tract in the East right-of-way line of F. M. 521, said point being located South 02 deg. 34 min. 33 sec. West - 2735.26 feet and South 87 deg. 38 min. 39 sec. East - 216.76 feet from a 3/4 inch iron pipe found at the intersection of the North line of the William Pettus League with the West right-of-way line of the Missouri-Pacific Railroad (abandoned), which point is the Southeast corner of a 7454.008 acre tract described in Volume 951, Page 578, Deed Records, said Beginning Point having coordinates of

X = 3,121,603.13 and Y = 605,295.47;

THENCE South 87 deg. 27 min. 27 sec. East, along the South line of the Neuhaus tract described in Volume 574, Page 64, Deed Records, a distance of 1169.47 feet to a 3/4 inch iron pipe set for corner in the centerline of a 40.0 foot platted road and the West line of Lot 15, Emigration Land Company Subdivision;

THENCE North 02 deg. 50 min. 20 sec. West, along the West line of Lot 15, a distance of 40.72 feet to a 3/4 inch iron pipe set for corner at the Southwest corner of the Brigham tract described in Volume 1862, Page 975, Deed Records;

THENCE South 64 deg. 45 min. 19 sec. East, along the South line of the Brigham tract, a distance of 294.81 feet to a 3/4 inch iron pipe set for corner in the West line of the Fabian Valdez tract described in Volume 2500, Page 1181, Deed Records;

THENCE South 02 deg. 50 min. 59 sec. East, along the West line of the Valdez tract, a distance of 761.0 feet to a 2 inch iron pipe found at the Southwest corner of the Valdez tract;

THENCE North 86 deg. 56 min. 08 sec. East, along the South line of the Valdez tract, the Ben J. Darnell tract described in Volume 2500, Page 1169, Deed Records, and the Martinez and Saldana tract described in Volume 2500, Page 1191, Deed Records, a distance of 2399.46 feet to a 2 inch iron pipe set for corner at the Northwest corner of the Bartholomew tract described in Volume 2043, Page 906, Deed Records;

THENCE South 02 deg. 51 min. 02 sec. East, along the West line of the Bartholomew tract, a distance of 1197.35 feet to a 2 inch iron pipe set at the Southwest corner of the Bartholomew tract;

THENCE North 86 deg. 54 min. 42 sec. East, along the South line of the Bartholomew tract, at 660.0 feet pass a 2 inch iron pipe found at the Southeast corner of the Bartholomew tract and the Southwest corner of the Jose Martinez tract described in Clerk's File 94-029430, and continue along the South line of said tract for a total distance of 1477.0 feet to a 2 inch iron pipe found at the Southeast corner of said tract;

THENCE South 02 deg. 51 min. 02 sec. East a distance of 124.56 feet to a 3/4 inch iron pipe set for corner, being the Southeast corner of the aforementioned Wheatley to South Texas Water Company tract described in Volume 160, Page 415, Deed Records;

THENCE South 86 deg. 54 min. 42 sec. West, along the South line of said tract and the South line of the aforementioned Olive to South Texas Water Company tract described in Volume 178, Page 332, Deed Records, a distance of 1077.81 feet to a 2 inch iron pipe set for corner at the Northwest corner of Lot 35 and the Northeast corner of Lot 34 of the Houston Fig Orchard Subdivision;

THENCE South 02 deg. 53 min. 59 sec. East, along the East line of Lots 34 and 37 and the West line of Lots 35 and 36, a distance of 1307.24 feet to an old 2 inch iron pipe found at the Southeast corner of the Phelps to South Texas Water Company tract;

THENCE South 87 deg. 06 min. 01 sec. West, along the South line of said tract and the North line of the Caldwell tract described in Clerk's File 9749474, a distance of 687.20 feet to a 3/4 inch iron pipe set for corner in the East line of the Tigner to South Texas Water Company tract;

THENCE South 35 deg. 25 min. 18 sec. East, along the East line of said tract, a distance of 876.89 feet to a 2 inch iron pipe set at the P.C. of a curve to the right;

THENCE following said curve to the right having a Radius = 625.0 feet, Central Angle of 30 deg. 29 min. 32 sec., Chord Bearing and Distance of South 20 deg. 10 min. 32 sec. East - 328.71 feet, for an arc distance of 332.62 feet to a 2 inch iron pipe set at the P.T. of said curve;

DEED



THENCE South 04 deg. 55 min. 46 sec. East a distance of 23.88 feet to a 2 inch iron pipe set for the Southeast corner of the herein described tract in County Road 56;

THENCE South 87 deg. 10 min. 52 sec. West a distance of 150.10 feet to a 2 inch iron pipe set for corner;

THENCE North 04 deg. 55 min. 46 sec. West a distance of 18.36 feet to a 2 inch iron pipe set at the P.C. of a curve to the left;

THENCE following said curve to the left having a Radius = 475.0 feet, Central Angle of 30 deg. 29 min. 32 sec., Chord Bearing and Distance of North 20 deg. 10 min. 32 sec. West - 249.82 feet, for an arc distance of 252.79 feet to a 2 inch iron pipe set at the P.T. of said curve;

THENCE North 35 deg. 25 min. 18 sec. West a distance of 972.53 feet to a 3/4 inch iron pipe set for corner in the South line of the Phelps to South Texas Water Company tract;

THENCE South 87 deg. 06 min. 01 sec. West, along the South line of said tract, a distance of 2198.53 feet to a 2 inch iron pipe found for corner at the Southwest corner of Lot 45 and being in the East line of the Caldwell tract described in Clerk's File 9731874;

THENCE North 02 deg. 46 min. 16 sec. West, along the West line of the Phelps to South Texas Water Company tract and the East line of the Caldwell tract, at 684.93 feet pass a 1 inch iron pipe found at the Northeast corner of the Caldwell tract and the Southeast corner of the Ramon O. Bolua tract described in Volume 2670, Page 981, Deed Records, and continue along the East line of the Bolua tract for a total distance of 2619.63 feet to a 3/4 inch iron pipe found at the Northeast corner of said tract and the Southeast corner of the John E. Craig tract described in Clerk's File 9828363;

THENCE North 02 deg. 50 min. 20 sec. East, along the East line of the Craig tract and the East line of the Neuhaus tract, a distance of 659.55 feet to a 3/4 inch iron pipe set for corner;

THENCE North 87 deg. 27 min. 27 sec. West, along the North line of the Neuhaus tract, a distance of 1188.45 feet to a 3/4 inch iron pipe found in the East right-of-way line of F. M. 521;

THENCE North 02 deg. 34 min. 33 sec. East, along the East line of F. M. 521, a distance of 200.22 feet to the PLACE OF BEGINNING and containing 191.19 acres of land.

BEARING BASE: Texas State Plane Coordinate System - South Central Zone. Coordinates based on USGS "Missouri City Monument #7045" NAD 27. Distances are true ground distances. To convert to grid, multiply by 0.998868.

Juliff2

## EXHIBIT "A"

76.14 ACRES OF LAND, BEING A PART OF THE STEPHEN F. AUSTIN 1-3/4 LEAGUE GRANT, ABSTRACT 37, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 76.14 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod found for the Southeast corner of the herein described tract in the North line of the Rowan Townsite recorded in Volume 1, Page 59, Plat Records, and the North line of a 63.06 acre tract described in Volume 1498, Page 429, Deed Records, said point being the Southwest corner of a 528.56 acre tract described in a deed to Ricetec, Inc. recorded in Volume (90)780, Page 555, Official Records, said Beginning Point having Coordinates:

X = 3,189,755.28 and Y = 557,194.34;

THENCE North 87 deg. 43 min. 09 sec. West, along the North line of said 63.06 acre tract, at 868.17 feet pass a 2 inch iron pipe set for reference corner, and continue for a total distance of 918.17 feet to a point for corner on the Northeast waters edge of Chocolate Bayou;

THENCE, along the Northeast waters edge of Chocolate Bayou, upstream the following courses and distances:

North 18 deg. 28 min. 08 sec. West - 73.23 feet,  
North 47 deg. 13 min. 07 sec. West - 61.74 feet,  
North 75 deg. 25 min. 28 sec. West - 86.83 feet,  
South 80 deg. 20 min. 45 sec. West - 94.22 feet,  
South 60 deg. 26 min. 58 sec. West - 175.27 feet,  
South 67 deg. 29 min. 26 sec. West - 52.75 feet,  
North 41 deg. 43 min. 22 sec. West - 66.18 feet,  
North 03 deg. 20 min. 36 sec. East - 26.06 feet,  
North 05 deg. 34 min. 12 sec. East - 175.68 feet,  
North 13 deg. 00 min. 10 sec. West - 62.14 feet,  
North 40 deg. 45 min. 17 sec. West - 76.91 feet,  
North 44 deg. 33 min. 33 sec. West - 97.45 feet,  
North 61 deg. 30 min. 29 sec. West - 207.79 feet,  
North 42 deg. 39 min. 09 sec. West - 89.77 feet,  
North 39 deg. 41 min. 33 sec. West - 155.81 feet,  
North 26 deg. 37 min. 25 sec. West - 222.67 feet,  
North 31 deg. 02 min. 34 sec. West - 100.89 feet, and  
South 82 deg. 32 min. 29 sec. West - 60.20 feet

to a point for corner at the Southeast corner of the Walsh and Gibson 108.28 acre tract described in Clerk's File 94-004154, from which point a 2 inch iron pipe bears North 05 deg. 39 min. 56 sec. West - 73.4 feet;

THENCE along the Southeast boundary of said 108.28 acre tract the following courses and distances:

North 25 deg. 40 min. 19 sec. East - 150.50 feet,  
North 31 deg. 22 min. 52 sec. East - 158.42 feet,  
North 23 deg. 15 min. 21 sec. East - 152.65 feet,  
North 51 deg. 40 min. 38 sec. East - 192.22 feet,  
North 42 deg. 15 min. 08 sec. East - 226.11 feet,  
North 32 deg. 32 min. 07 sec. East - 84.48 feet,  
North 66 deg. 46 min. 41 sec. East - 15.0 feet,  
North 34 deg. 07 min. 48 sec. East - 264.68 feet, and  
North 37 deg. 09 min. 32 sec. East - 391.41 feet

to a point marking the most Westerly corner of the  
aforementioned Ricetec tract;

THENCE South 45 deg. 20 min. 51 sec. East, along a line of  
said Ricetec tract, at 145.58 feet pass a 1/2 inch iron rod  
found, and continue for a total distance of 290.27 feet to  
a 1/2 inch iron rod found for corner;

THENCE North 60 deg. 46 min. 54 sec. East, along a line of  
said Ricetec tract, a distance of 249.15 feet to a 1/2 inch  
iron rod found for corner at the West corner of an 11.89  
acre tract this day surveyed, which is also shown as Canal  
Area No. 1 in the aforementioned Ricetec deed;

THENCE South 42 deg. 42 min. 06 sec. East, along the  
Southwest line of said 11.89 acre tract, at 197.02 feet  
pass a 1/2 inch iron rod found at the South corner of said  
tract, and continue along a line of the Ricetec tract for a  
total distance of 641.52 feet to a 1/2 inch iron rod found  
for corner;

THENCE South 14 deg. 16 min. 28 sec. East, along a line of  
the Ricetec tract, a distance of 1556.91 feet to a 1/2 inch  
iron rod found for corner;

THENCE South 23 deg. 23 min. 05 sec. West, along a line of  
the Ricetec tract, a distance of 305.08 feet to the PLACE  
OF BEGINNING and containing 76.14 acres of land.

BEARING BASE: Texas State Plane Coordinate System - South  
Central Zone. Coordinates based on USGS "Liverpool" NAD  
27. Distances are true ground distances. To convert to  
grid, multiply by 0.999864.

## Exhibit A

11.89 ACRES OF LAND, BEING A PART OF THE STEPHEN F. AUSTIN 1-3/4 LEAGUE GRANT, ABSTRACT 37, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 11.89 ACRES ALSO BEING A PART OF THAT CERTAIN 12.39 ACRE TRACT DESCRIBED AS CANAL AREA NO. 1 IN A DEED TO RICETEC, INC. RECORDED IN VOLUME (90)780, PAGE 555, OFFICIAL RECORDS, SAID 11.89 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING at a 1/2 inch iron rod found for the Southeast corner of a 76.14 acre tract this day surveyed, in the North line of the Rowan Townsite recorded in Volume 1, Page 59, Plat Records, and the North line of a 63.06 acre tract described in Volume 1498, Page 429, Deed Records, said point being the Southwest corner of a 528.56 acre tract described in the aforementioned deed to Ricetec, Inc., said Commencing Point having Coordinates:

X = 3,189,755.28 and Y = 557,194.34;

THENCE North 23 deg. 23 min. 05 sec. East, along the common line of said 76.14 acre tract and the Ricetec tract, a distance of 305.08 feet to a 1/2 inch iron rod found;

THENCE North 14 deg. 16 min. 28 sec. West, along the common line of said 76.14 acre tract and the Ricetec tract, a distance of 1556.91 feet to a 1/2 inch iron rod found;

THENCE North 42 deg. 42 min. 06 sec. West, along the common line of said 76.14 acre tract and the Ricetec tract, a distance of 444.50 feet to a 1/2 inch iron rod found for the most Southerly corner of the herein described tract and also the PLACE OF BEGINNING, said point being the South corner of the aforementioned 12.39 acre tract;

THENCE North 42 deg. 42 min. 06 sec. West, along the Northeast line of said 76.14 acre tract, a distance of 197.02 feet to a 1/2 inch iron rod found at the West corner of said 12.39 acre tract;

THENCE North 60 deg. 46 min. 54 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 1931.71 feet to a 1/2 inch iron rod found for angle point;

THENCE North 43 deg. 54 min. 50 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 124.46 feet to a 1/2 inch iron rod found for angle point;

THENCE North 37 deg. 19 min. 47 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 391.84 feet to a 1/2 inch iron rod set for angle point;

THENCE North 40 deg. 42 min. 39 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 214.88 feet to a 1/2 inch iron rod found in the Southwest right-of-way line of F. M. 2917;

THENCE in a Southeasterly direction, along the Southwest line of F. M. 2917, following a curve to the left having a Radius = 1970.08 feet, Central Angle of 06 deg. 09 min. 13 sec., Chord Bearing and Distance of South 29 deg. 38 min. 10 sec. East - 211.49 feet, for an arc distance of 211.59 feet to a 1/2 inch iron rod found for corner in the Southeast line of said 12.39 acre tract;

THENCE South 37 deg. 49 min. 54 sec. West, along the Southeast line of said 12.39 acre tract, a distance of 639.75 feet to a 1/2 inch iron rod found for angle point;

THENCE South 60 deg. 53 min. 05 sec. West, along the Southeast line of said 12.39 acre tract, a distance of 1978.60 feet to the PLACE OF BEGINNING and containing 11.89



Exhibit A

10.49 ACRES OF LAND, BEING A PART OF THE STEPHEN F. AUSTIN 1-3/4 LEAGUE GRANT, ABSTRACT 37, AND THE HOOPER AND WADE SURVEY, SECTION 3, ABSTRACT 428, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 10.49 ACRES ALSO BEING A PART OF THAT CERTAIN 12.64 ACRE TRACT DESCRIBED AS CANAL AREA NO. 3 IN A DEED TO RICETEC, INC. RECORDED IN VOLUME (90)780, PAGE 555, OFFICIAL RECORDS, SAID 10.49 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 5/8 inch iron rod found for the Northwest corner of the herein described tract at the Northeast corner of a 0.57 acre tract surveyed by Baker and Lawson dated November 30, 2000, said point being in the South line of a 1.571 acre tract described in a Deed of Trust to Martin M. Molot recorded in Clerk's File 95-009938, said point being located South 84 deg. 04 min. 18 sec. East - 150.29 feet from a 1/2 inch iron rod found at the Southwest corner of said 1.571 acre tract, said Beginning Point having Coordinates:

X = 3,191,985.54 and Y = 561,585.49;

THENCE South 84 deg. 04 min. 18 sec. East, along the South line of said 1.571 acre tract, a distance of 11.46 feet to a 5/8 inch iron rod found for angle point;

THENCE North 78 deg. 18 min. 03 sec. East, along the South line of said 1.571 acre tract, a distance of 202.03 feet to a 5/8 inch iron rod found at the Southeast corner of said tract in a line of the aforementioned 12.64 acre tract;

THENCE South 02 deg. 22 min. 48 sec. East, along a line of said 12.64 acre tract, a distance of 17.62 feet to a 1/2 inch iron rod set for corner;

THENCE North 80 deg. 37 min. 59 sec. East, along the North line of said 12.64 acre tract, a distance of 899.91 feet to a 1/2 inch iron rod set in the common line of the Stephen F. Austin 1-3/4 League Grant, Abstract 37, and the Hooper and Wade Survey, Section 3, Abstract 428, said point being in the Southwest line of the Stacy Botter tract described in Volume 899, Page 188, Deed Records;

THENCE South 50 deg. 30 min. 46 sec. East, along the common line of said Surveys and the Southwest line of the Potter tract, being a line of said 12.64 acre tract, a distance of 87.35 feet to a 1/2 inch iron rod set for corner at the South corner of the Botter tract;

THENCE North 39 deg. 28 min. 09 sec. East, along the Southeast line of the Botter tract and the Northwest line of said 12.64 acre tract, a distance of 1279.29 feet to a 1/2 inch iron rod set for corner;

THENCE North 89 deg. 37 min. 41 sec. East, along a line of said 12.64 acre tract, a distance of 1600.88 feet to a 1/2 inch iron rod found for angle point;

THENCE South 54 deg. 59 min. 29 sec. East, along a line of said 12.64 acre tract, a distance of 110.31 feet to a 1/2 inch iron rod set at the East corner of said 12.64 acre tract in the Northwest right-of-way line of the Missouri-Pacific Railroad (100.0 feet wide);

THENCE South 39 deg. 26 min. 08 sec. West, along the Northwest line of said Railroad, a distance of 142.20 feet to a 1/2 inch iron rod set for corner;

THENCE North 55 deg. 26 min. 47 sec. West, along the Southwest line of said 12.64 acre tract, a distance of 100.66 feet to a 1/2 inch iron rod found for angle point;

THENCE South 89 deg. 05 min. 38 sec. West, along the South line of said 12.64 acre tract, a distance of 1521.40 feet to a 1/2 inch iron rod found for angle point;

THENCE South 41 deg. 13 min. 53 sec. West, along a line of said 12.64 acre tract, a distance of 1244.49 feet to a 1/2 inch iron rod found for angle point;

THENCE South 80 deg. 09 min. 19 sec. West, along the South line of said 12.64 acre tract, a distance of 780.26 feet to a 1/2 inch iron rod set for corner;

THENCE South 00 deg. 06 min. 28 sec. East, along a line of said 12.64 acre tract, a distance of 13.24 feet to a 1/2 inch iron rod found for corner;

THENCE South 84 deg. 13 min. 13 sec. West, along the South line of said 12.64 acre tract, a distance of 394.48 feet to a 5/8 inch iron rod found for corner at the Southeast corner of the aforementioned 0.57 acre tract;

THENCE North 02 deg. 21 min. 17 sec. East, along the East line of said 0.57 acre tract, a distance of 151.45 feet to the PLACE OF BEGINNING and containing 10.49 acres of land.



## Exhibit A

5.40 acres of land being a part of the C.M. Hays Survey, Abstract 533 and Abstract 536, Brazoria County, Texas and being a part of that certain 668.389 acre tract described in a release of Surface Rights recorded in Volume 1760, Page 488, Deed Records of Brazoria County, Texas and also being a part of that certain 166.707 acre tract described in a Substitute Trustee Deed of IP Farms, Inc. recorded in Volume (88)541, Page 105, Official Records, Brazoria County, Texas

and being more particularly described by metes and bounds as follows:

BEGINNING at a 1 inch iron pipe set for the Northwest corner of the herein described tract in the North line of said 166.707 acre tract and the South line of the S.M. Chang tract described in Volume 1760, Page 531, Deed Records, said point being located North 87 deg. 31 min. East - 55.0 feet from a 3/4 inch rod found in the East right-of-way line of State Highway 288 at the Northwest corner of said 166.707 acre tract and the Southwest corner of the Chang tract;

THENCE North 87 deg. 31 min. East, along the North line of said 166.707 acre tract and the South line of the Chang tract a distance of 101.32 feet to a 1 inch iron pipe set for corner;

THENCE South 02 deg. 27 min. 34 sec. East a distance of 1431.17 feet to a 1 inch iron rod set for corner;

THENCE North 87 deg. 04 min. 03 sec. East a distance of 677.82 feet to a 1 inch iron rod set for corner;

THENCE South 02 deg. 55 min. 57 sec. East a distance of 100.0 feet to a 5/8 inch iron rod found in the South line of said 166.707 acre tract and the North line of the H.T. & B. RR Company Survey, Section 7, Abstract 236;

THENCE South 87 deg. 04 min. 03 sec. West, along the South line of said 166.707 acre tract a distance of 844.03 feet to a 3/4 inch iron rod found for the Southwest corner of the herein described tract in the East right-of-way line of State Highway 288 (420.0 feet ROW as described in Volume 1207, Page 138, Deed Records) at the Southwest corner of said 166.707 acre tract;

THENCE along the East right-of-way line of State Highway 288, following a curve to the left, having a radius of 11,669.16 feet, central angle 00 deg. 40 min. 49 sec., Chord Bearing and distance North 01 deg. 08 min. 51 sec. West - 138.57 feet for an arc distance of 138.57 feet to a 1 inch iron pipe set for corner;

THENCE North 87 deg. 04 min. 03 sec. East a distance of 56.04 feet to a 1 inch iron pipe set for corner;

THENCE North 02 deg. 15 min. 36 sec. West a distance of 1393.52 feet to the PLACE OF BEGINNING and containing 5.40 acres of land.

AS PER ORIGINAL

## Exhibit A

2.41 ACRES OF LAND, BEING A PART OF LOT 400 OF THE EMIGRATION LAND COMPANY SUBDIVISION OF THE C. M. HAYES SURVEY, SECTION 2, ABSTRACT 531, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 113, PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN 6.667 ACRE TRACT DESCRIBED IN A SUBSTITUTE TRUSTEES DEED TO I.P. FARMS, INC. RECORDED IN VOLUME (87)415, PAGE 415, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 2.41 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a ½ inch iron rod set at the Northeast corner of Lot 400 and the Northeast corner of Section 2 at the intersection of the centerline of County Road 48 with the centerline of County Road 64;

THENCE South, along the East line of Section 2 and the West line of the W. H. Dennis Survey, Section 50, Abstract 512, a distance of 880.47 feet to a ½ inch iron rod set at the Southeast corner of Lot 400, from which point a ¾ inch iron rod bears 3.53 South and 3.32 West;

THENCE West, along the South line of Lot 400 and the North line of Lot 410, a distance of 94.65 feet to a ½ inch iron rod set for corner at the Southeast corner of a 4.37 acre tract this day surveyed;

THENCE North 00 deg. 05 min. 43 sec. East, along the East line of said 4.37 acre tract, a distance of 745.96 feet to a ½ inch iron rod set for angle point;

THENCE North 32 deg. 44 min. 09 sec. West, along a line of said 4.37 acre tract, a distance of 48.29 feet to a ½ inch iron rod set for angle point;

THENCE North 88 deg. 02 min. 35 sec. West, along the North line of said 4.37 acre tract, a distance of 215.74 feet to a ½ inch iron rod set at the Northwest corner of said 4.37 acre tract in the West line of Lot 400 and the East line of Lot 390 as described in a deed to Kay Bell recorded in Clerk's File 97-003320;

THENCE North 00 deg. 04 min. 37 sec. East, along the common line of Lots 390 and 400, a distance of 86.53 feet to a ½ inch iron rod set at the Northwest corner of Lot 400 and the Northeast corner of Lot 390 in the North line of Section 2, being in County Road 64;

THENCE East, along the North line of Section 2, a distance of 335.02 feet to the PLACE OF BEGINNING and containing 2.41 acres of land.



Exhibit A

1129.43 ACRES OF LAND, BEING A PART OF THE EDMOND ANDREWS LEAGUE, ABSTRACT 5, AND THE PERRY AND AUSTIN LEAGUE, ABSTRACT 110, BRAZORIA COUNTY, TEXAS, AND BEING OUT OF THE TEXAS ORCHARD DEVELOPMENT COMPANY SUBDIVISION NO. 1 IN THE PERRY AND AUSTIN LEAGUE, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 49, PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IF FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 1129.43 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 5/8 inch iron rod with aluminum cap found for the East corner of the herein described tract and the South corner of the Petronillo Esquivel tract described in Clerk's File 98-038075, said point being located South 50 deg. 32 min. 17 sec. East - 83.92 feet from a 5 inch by 5 inch concrete monument found at the East corner of the Perry and Austin League, Abstract 110, said Beginning Point having Coordinates:

X = 3,217,503.33 and Y = 552,447.34;

THENCE South 35 deg. 42 min. West a distance of 113.37 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 38 deg. 53 min. 36 sec. West a distance of 541.07 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 51 deg. 19 min. 41 sec. West a distance of 1814.72 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 62 deg. 01 min. 43 sec. West a distance of 392.48 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 49 deg. 42 min. 04 sec. West a distance of 222.67 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 55 deg. 12 min. 07 sec. West a distance of 3591.23 feet to a 3/4 inch iron pipe set for corner;

THENCE North 85 deg. 23 min. 15 sec. West a distance of 35.81 feet to a 3/4 inch iron pipe set for corner;

THENCE North 34 deg. 57 min. 57 sec. West a distance of 50.77 feet to a 3/4 inch iron pipe set for corner;

THENCE North 23 deg. 35 min. 31 sec. West a distance of 3072.52 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 23 deg. 42 min. 32 sec. West a distance of 7454.82 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 28 deg. 50 min. 25 sec. West a distance of 414.64 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 29 deg. 34 min. 29 sec. West a distance of 564.38 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 45 deg. 20 min. 29 sec. West a distance of 1393.88 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 45 deg. 29 min. 06 sec. West a distance of 939.0 feet to a 3/4 inch iron pipe set for the most Westerly corner of the herein described tract;

THENCE North 44 deg. 30 min. 54 sec. East a distance of 390.56 feet to a 3/4 inch iron pipe set for corner;

THENCE North 00 deg. 57 min. 36 sec. West a distance of 1004.76 feet to a 3/4 inch iron pipe set for the most Northerly corner of the herein described tract in the Northeast line of the Perry and Austin League and the Southwest line of the H.T. & B. R.R. Company Survey, Section 3, Abstract 220, and the Southwest line of a 13.89 acre tract described in Clerk's File 93-018755;

THENCE South 50 deg. 32 min. 17 sec. East, along the Northeast line of the Perry and Austin League, the Southwest line of Section 3, the Southwest line of said 13.89 acre tract, the Southwest line of the Charles O'Donnell Survey, Section 2, Abstract 492, the Southwest line of the W. J. Palmer tract described in Volume 760, Page 411, Deed Records, the Southwest line of the S. M. Schleicher tract described in Volume 433, Page 438, Deed Records, the Southwest line of the F. R. Oldham tract described in Volume 216, Page 311, Deed Records, passing the South corner of Section 2 and the West corner of the A. G. Reynolds Survey, Abstract 121, and continue along the Southwest line of the Reynolds Survey, the First National Bank of Minneapolis tract described in Volume 838, Page 636, Deed Records, the J. G. Jackson tract described in Volume 290, Page 12, Deed Records, the Randy J. Sims tract described in Volume (91)897, Page 306, Official Records, the Decker and Brady tract described in Volume 1742, Page 792, Deed Records, the Margaret P. Clouser tract described in Volume 1742, Page 792, Deed Records, and the Esquivel tract for a total distance of 14847.21 feet to the PLACE OF BEGINNING and containing 1129.43 acres of land, less and except that certain 20.0 acre tract known as Lots 8 and 9,

Block 17, of the Texas Orchard Development Company Subdivision No. 1 described in a Quit Claim Deed to C. S. McCoy recorded in Volume 1454, Page 327, Deed Records, and a Warranty Deed to Harlow Royalties, Inc. recorded in Volume 1372, Page 219, Deed Records, leaving a net acreage of 1109.43 acres of land.

Exhibit A

34.41 ACRES OF LAND, BEING A PART OF TRACT 70 OF THE STEPHEN F. AUSTIN 1 3/4 LEAGUE, ABSTRACT 37, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 34.41 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1 inch iron pipe found for the Northwest corner of the herein described tract in the Southwest line of the Missouri-Pacific Railroad 90.0 foot Easement described in Volume 796, Page 288, Deed Records, said point being the Northeast corner of a 51.06 acre tract described in a deed from IP Farms to J. Curtis DuPriest recorded in Clerk's File 00-002612;

THENCE South 50 deg. 31 min. 51 sec. East, along the Southwest line of said railroad easement, at 45.23 feet pass the Southwest corner of the Duck Lake Lateral North Easement this day surveyed, at 221.54 feet pass the Southeast corner of said easement, and continue for a total distance of 4848.21 feet to a 1/2 inch iron rod set for corner;

THENCE South 04 deg. 52 min. 16 sec. West a distance of 74.66 feet to a 1/2 inch iron rod set for corner in the North line of a 60.0 foot road easement;

THENCE North 85 deg. 07 min. 44 sec. West a distance of 388.89 feet to a 1/2 inch iron rod set for corner;

THENCE South 39 deg. 28 min. 09 sec. West a distance of 51.45 feet to a 5/8 inch iron rod with aluminum cap found for corner at the East corner of a 20.0 acre tract known as Tract 71 described in Volume 96, Page 346, Deed Records, said point being an ell corner of Parcel 34, Tract 1;

THENCE North 50 deg. 31 min. 51 sec. West, along a line of Parcel 34, Tract 1, and the Northeast line of Tracts 71 and 72 of the Austin League, being the Northeast line of said 20.0 acre tract, the Mortensen tract described in Volume 748, Page 634, Deed Records, the Mortensen tract described in Volume 1118, Page 56, Deed Records, and the Peterson tract described in Volume 636, Page 290, Deed Records, a distance of 4089.52 feet to a 1 inch iron pipe found at the upper Southeast corner of the aforementioned 51.06 acre tract;

THENCE North 15 deg. 46 min. 29 sec. West, along a line of said 51.06 acre tract, a distance of 585.63 feet to the PLACE OF BEGINNING and containing 34.41 acres of land.

## Exhibit A

30.10 ACRES OF LAND, BEING A PART OF THE PERRY AND AUSTIN LEAGUE, ABSTRACT 110, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 30.10 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod inside a 1 inch PVC pipe found in the Northwest line of the Perry and Austin League, Abstract 110, said point being the most Easterly North corner of a 54.69 acre tract described in a deed to Kent R. Lynch recorded in Clerk's File 96-003162, said Beginning Point having Coordinates:

X = 3,198,525.96 and Y = 564,777.70;

THENCE North 39 deg. 28 min. 09 sec. East, along the Northwest line of Abstract 110, a distance of 930.09 feet to a 3/4 inch iron pipe set for the North corner of the herein described tract and the West corner of a Canal Easement of varying widths this day surveyed;

THENCE South 35 deg. 17 min. 38 sec. East a distance of 486.93 feet to a 1/2 inch iron rod set for corner;

THENCE South 31 deg. 04 min. 56 sec. East a distance of 352.62 feet to a 1/2 inch iron rod set for corner;

THENCE South 37 deg. 25 min. 22 sec. West a distance of 2059.95 feet to a 3/4 inch iron pipe set for corner;

THENCE North 89 deg. 12 min. 13 sec. West a distance of 152.72 feet to a 1/2 inch iron rod set for corner at the East corner of a Canal Easement of varying widths this day surveyed;

THENCE North 33 deg. 16 min. 29 sec. West, with a line of said easement, a distance of 146.76 feet to a 1/2 inch iron rod found for corner in the Southeast line of the aforementioned 54.69 acre Lynch tract;

THENCE North 68 deg. 26 min. 35 sec. East, along the Southeast line of the Lynch tract, a distance of 129.69 feet to a 1/2 inch iron rod found for corner;

THENCE North 14 deg. 46 min. 30 sec. East, along the Southeast line of the Lynch tract, a distance of 1444.46 feet to a 1/2 inch iron rod found for corner;

THENCE North 50 deg. 31 min. 51 sec. West, along the Northeast line of the Lynch tract, a distance of 75.84 feet to the PLACE OF BEGINNING and containing 30.10 acres of land.



Exhibit A

11.15 ACRES OF LAND, BEING A PART OF THE WEST 1/2 OF THE WEST 1/2 OF THE H.T. & B. R.R. COMPANY SURVEY, SECTION 10, ABSTRACT 535, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THOSE CERTAIN TRACTS DESCRIBED IN A DEED FROM GENERAL CRUDE OIL COMPANY TO IP FARMS, INC. RECORDED IN VOLUME 1465, PAGE 645, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 2 inch iron pipe set for the Northwest corner Section 10 in the South line of the Lavaca Navigation Co. Survey, Section 11, Abstract 327, said point being located North 00 deg. 06 min. 42 sec. West - 68.48 feet from the Northeast corner of Oak Meadows Estates according to the plat recorded in Volume 17, Pages 175-176, Plat Records;

THENCE North 89 deg. 53 min. 36 sec. East, along the North line of Abstract 535 and the South line of Abstract 327 and the South line of the Lavaca Navigation Co. Survey, Section 12, Abstract 536, a distance of 4101.50 feet to a 2 inch iron pipe set for the Northeast corner of this tract and the Northwest corner of the South Freeway, LTD. tract recorded in Volume 1186, Page 622, Deed Records;

THENCE South 00 deg. 33 min. 28 sec. West, along the West line of the South Freeway, LTD. tract, a distance of 80.0 feet to a 1 inch iron pipe set for corner at the Northeast corner of a 63.96 acre tract (Tract "B") this day surveyed;

THENCE South 89 deg. 53 min. 36 sec. West, along the North line of Tract "B", at 358.53 feet pass a 1 inch iron pipe set in the West line of County Road 48, at 2090.85 feet pass a 1 inch iron pipe set at the Northwest corner of Tract "B" and the Northeast corner of a 121.14 acre tract (Tract "A") this day surveyed and continue along the North line of Tract "A" for a total distance of 1939.71 feet to a 1 inch iron pipe set for the Northwest corner of Tract "A";

THENCE South 00 deg. 06 min. 42 sec. East, along the West line of Tract "A", a distance of 1952.13 feet to a 1 inch iron pipe set for angle point;

THENCE South 09 deg. 29 min. 30 sec. East, along the West line of Tract "A", a distance of 112.46 feet to a 1 inch iron pipe set for angle point;

THENCE South 01 deg. 24 min. 20 sec. East, along the West line of Tract "A", a distance of 134.65 feet to a 1 inch iron pipe set for corner in the North line of a 10.0 acre tract described in Volume (89)737, Page 442, Official Records;

THENCE South 89 deg. 51 min. 44 sec. West, along the North line of said 10.0 acre tract, at 28.66 feet pass the Northwest corner of said tract and continue for a total distance of 91.38 feet to a point for corner in the West line of Abstract 535 and the East line of the Andrew Robinson League, Abstract 125;

THENCE North 00 deg. 06 min. 42 sec. West, along the West line of Abstract 535 and the East line of the Robinson League and the East line of Oak Meadows Estates, for a distance of 2277.74 feet to the PLACE OF BEGINNING and containing 11.15 acres of land.



## Exhibit A

13.63 ACRES OF LAND BEING A PART OF LOT 7 OF THE STERN SUBDIVISION OF THE JOSHUA ABBOTT LEAGUE, ABSTRACT 144, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 74, PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED AS PARCEL 54 IN A DEED TO IF FARMS, INC., RECORDED IN VOLUME 1465, PAGE 645, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

AS PER ORIGINAL

BEGINNING at a 1 inch iron pipe set in the North line of Lot 7 at the Northwest corner of a 135.07 acre tract this day surveyed, said point being located South 86 deg. 10 min. 54 sec. West - 1110.12 feet from a 1 inch iron pipe set at the Northeast corner of Lot 7 of the Stern Subdivision and the Northwest corner of a 104.41 acre tract described in a deed to G. E. Wrightstone recorded in Volume 1302, Page 58, Deed Records, said BEGINNING point being in the South line of Lot 15 of the Bosler Subdivision as recorded in Volume 1, Page 88, Plat Records, and the South line of the Gerald W. Evers tract recorded in Volume 1521, Page 660, Deed Records;

THENCE South 86 deg. 10 min. 54 sec. West, along the North line of Lot 7 and the South line of Lots 15 & 16, Bosler Subdivision, a distance of 310.11 feet to a 1 inch iron pipe set at the Northwest corner of Lot 7 and the Northeast corner of Lot 6, Stern Subdivision;

THENCE South 03 deg. 56 min. 53 sec. East, along the West line of Lot 7 and the East line of Lot 6, at 16.37 feet pass a 1/2 inch iron rod found at the Northeast corner of the Albert J. Pekar tract as described in Clerk's File 93-044131 and continue along the common line of Lots 6 & 7 and the East line of the Albert J. Pekar tract, the East line of the Tina Pekar tract described in Clerk's File 94-001652, and the East line of the Allen R. Pekar tract described in Clerk's File 93-044132 for a distance of 3554.38 feet to a 1/2 inch iron rod found for angle point;

THENCE South 04 deg. 14 min. 29 sec. East, along the East line of the Allen R. Pekar tract, at 971.34 feet pass a 1/2 inch iron-rod found for reference corner and continue for a total distance of 1027.70 feet to the Southwest corner of Lot 7 in County Road 45 (80.0 feet wide);

THENCE North 85 deg. 52 min. 52 sec. East, along the South line of Lot 7, a distance of 119.77 feet to a point marking the Southeast corner of this tract and the Southwest corner of said 135.07 acre tract;

THENCE North 04 deg. 00 min. 40 sec. West, along the West line of said 135.07 acre tract, at 56.11 feet pass a 1 inch iron pipe set for reference corner and continue for a total distance of 4244.66 feet to a 1 inch iron pipe set for angle point;

THENCE North 26 deg. 15 min. 16 sec. East, along the West line of said 135.07 acre tract, a distance of 282.55 feet to a 1 inch iron pipe set for angle point;

THENCE North 86 deg. 10 min. 54 sec. East, along a line of said 135.07 acre tract, a distance of 47.40 feet to a 1 inch iron pipe set for corner;

THENCE North 03 deg. 49 min. 06 sec. West, along a line of said 135.07 acre tract, a distance of 92.26 feet to the PLACE OF BEGINNING and containing 13.63 acres of land.

Exhibit A

1.01 ACRES OF LAND, BEING A PART OF THE PERRY AND AUSTIN SURVEY, ABSTRACT 109, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 1.01 ACRE TRACT BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING at a 5/8 inch iron rod with aluminum cap found for the East corner of a 1129.43 acre tract this day surveyed and the South corner of the Petronillo Esquivel tract described in Clerk's File 98-038075, said point being located South 50 deg. 32 min. 17 sec. East - 83.92 feet from a 5 inch by 5 inch concrete monument found at the East corner of the Perry and Austin League, Abstract 110, said Commencing Point having Coordinates:

X = 3,217,503.33 and Y = 552,447.34,  
from said Commencing Point the following courses and distances are coincident with the Northeast line of a 100.0 foot Canal Easement and a Canal Easement of varying widths this day surveyed;

THENCE North 39 deg. 53 min. 18 sec. East, along the South line of the Esquivel tract, a distance of 24.90 feet to a 1/2 inch iron rod set for corner;

THENCE South 53 deg. 01 min. 17 sec. East a distance of 147.94 feet to an angle point;

THENCE South 48 deg. 03 min. 05 sec. East a distance of 2609.38 feet to an angle point;

THENCE South 47 deg. 55 min. 37 sec. East a distance of 4506.75 feet to an angle point;

THENCE South 56 deg. 27 min. 12 sec. East a distance of 91.62 feet to an angle point;

THENCE South 62 deg. 00 min. 09 sec. East a distance of 3067.95 feet to an angle point;

THENCE South 82 deg. 25 min. 25 sec. East a distance of 127.99 feet to an angle point;

THENCE South 87 deg. 43 min. 43 sec. East a distance of 811.94 feet to an angle point;

THENCE South 80 deg. 53 min. 19 sec. East a distance of 228.53 feet to a 1/2 inch iron rod set for the West corner of the varying width Canal Easement;

THENCE North 38 deg. 59 min. 34 sec. East a distance of 1488.15 feet to an angle point;

THENCE North 40 deg. 11 min. 06 sec. East a distance of 2539.98 feet to an angle point;

THENCE North 44 deg. 15 min. 22 sec. East a distance of 405.52 feet to a 3/4 inch iron rod set for the North corner of said easement and the PLACE OF BEGINNING of the herein described tract, said Beginning Point having Coordinates:

X = 3,229,729.25 and Y = 549,425.16;



THENCE North 43 deg. 10 min. 56 sec. West a distance of 14.19 feet to a point for corner on the Southerly bank of Hall's Bayou;

THENCE along the Southerly bank of Hall's Bayou the following courses and distances:

North 69 deg. 42 min. 21 sec. East - 97.13 feet,

North 80 deg. 12 min. 04 sec. East - 84.07 feet,

North 52 deg. 22 min. 47 sec. East - 34.79 feet,

South 87 deg. 45 min. 39 sec. East - 66.08 feet, and

South 80 deg. 34 min. 24 sec. East - 153.11 feet

to a point for corner in the centerline of a drainage ditch;

THENCE up the centerline of said drainage ditch the following courses and distances:

South 34 deg. 49 min. 09 sec. West - 61.48 feet,

South 81 deg. 13 min. 59 sec. West - 94.46 feet,

South 66 deg. 28 min. 25 sec. West - 46.31 feet, and

South 36 deg. 33 min. 08 sec. West - 150.0 feet

to a 3/4 inch iron pipe set for corner;

THENCE North 48 deg. 39 min. 11 sec. West a distance of 46.69 feet to a 3/4 inch iron pipe set at the East corner of the aforementioned varying width Canal Easement;

THENCE North 43 deg. 10 min. 56 sec. West, along the Northeast line of said easement, a distance of 166.07 feet to the PLACE OF BEGINNING and containing 1.01 acres of land.



## Exhibit A

187.40 ACRES OF LAND, BEING A PART OF THE DAY LAND AND CATTLE COMPANY SURVEY, ABSTRACT 601, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 26, TRACT 2, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 187.40 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod set for the Northeast corner of the herein described tract, said point being located North 59 deg. 56 min. 42 sec. East - 36.22 feet from a 1/2 inch iron rod found at an ell corner of Abstract 601 and the Southeast corner of the H.T. & B. R.R. Company Survey, Section 16, Abstract 518, Brazoria County, Texas, and also the Southeast corner of a certain 81.12 acre tract described in a deed to Wildlife Lakes, L.L.C. recorded in Clerk's File 99-019065, said Beginning Point having Coordinates:

X = 3,178,856.41 and Y = 545,607.40;

THENCE South 30 deg. 25 min. 04 sec. East a distance of 1740.17 feet to a 3/4 inch iron pipe set for corner;

THENCE South 42 deg. 26 min. 48 sec. West a distance of 16.30 feet to a 3/4 inch iron pipe set for corner;

THENCE South 30 deg. 51 min. 49 sec. East a distance of 560.64 feet to a 3/4 inch iron pipe set for corner in the Northwest right-of-way line of the St. Louis, Brownsville, and Mexico Railroad (100.0 feet wide);

THENCE South 39 deg. 25 min. 36 sec. West, along the Northwest line of said railroad, a distance of 3041.20 feet to a 3/4 inch iron pipe set for corner;

THENCE North 31 deg. 56 min. 13 sec. West a distance of 663.58 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 30 deg. 12 min. 49 sec. West a distance of 2708.35 feet to 3/4 inch iron pipe set for corner in the North line of Abstract 601 and the South line of Section 16;

THENCE North 59 deg. 56 min. 42 sec. East, along the common line of said Surveys, at 1421.10 feet pass an old 1 inch iron pipe found at the Southwest corner of the aforementioned 81.12 acre tract, at 2837.57 feet pass the first mentioned 1/2 inch iron rod at the Southeast corner of said tract, and continue for a total distance of 2874.18 feet to the PLACE OF BEGINNING and containing 187.40 acres of land.

BEARING BASE: Texas State Plane Coordinate System - South Central Zone. Coordinates based on USGS "Liverpool" NAD 27. Distances are true ground distances. To convert to grid, multiply by 0.999864.

## Exhibit A

FIELD NOTES OF A 7.82 ACRE TRACT OUT OF LOT 6 OF THE BOSLER SUBDIVISION OF THE JOSHUA ABBOTT SURVEY, ABSTRACT 144, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 1, PAGE 88 OF THE PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PORTION OF THAT SAME PROPERTY CONVEYED BY DEED DATED DECEMBER 15, 1948, FROM D.M. HAVLIC TO THE SOUTH TEXAS WATER COMPANY, RECORDED IN VOLUME 442, PAGE 442 THROUGH 444 OF THE DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND SAID 7.82 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at a 3/4" iron rod found marking the Northeast corner of Lot 7 of the Bosler Subdivision in the Joshua Abbott Survey;

THENCE; South 88°53'35" West 1536.19 feet, along the North line of said Lot 7, to a 3/4" iron rod found marking the Northwest corner of said Lot 7 and the Northeast corner of Lot 6 of the Bosler Subdivision;

THENCE; South 88°57'45" West 1354.28 feet, along the North line of said Lot 6, to a 1/2" iron rod set for the place of beginning of the herein described tract;

THENCE; South 0°15'56" West 2271.87 feet to a 1/2" iron rod set for corner in the North right-of-way line of County Road 49;

THENCE; South 88°55'55" West 115.00 feet, along the North right-of-way line of County Road 49, to a 1/2" iron rod set for corner at the Southwest corner of said Lot 6;

THENCE; North 1°30' West, at 2267.22 feet pass a 1/2" iron rod set on line along the West line of said Lot 6, continue to a total distance of 2271.42 feet to a point for corner at the Northwest corner of said Lot 6;

THENCE; North 88°57'45" East 185.00 feet, along the North line of said Lot 6, to the place of beginning.

Said tract therein containing 7.82 acres of land.

## Exhibit A

2.80 ACRES OF LAND BEING A PART OF THE C.M. HAYS SURVEY, ABSTRACT 533, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN 668.389 ACRE TRACT DESCRIBED IN A RELEASE OF SURFACE RIGHTS RECORDED IN VOLUME 1760, PAGE 488, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND ALSO BEING A PART OF THAT CERTAIN 166.707 ACRE TRACT DESCRIBED IN A SUBSTITUTE TRUSTEE DEED TO IP FARMS, INC. RECORDED IN VOLUME (88)541, PAGE 105, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS SAID 2.80 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 3/4 inch iron rod found for the Southeast corner of the herein described tract at the Southeast corner of said 166.707 acre tract and the Southeast corner of Abstract 533, the Northeast corner of Abstract 236, the Southwest corner of the A.A. Talmage Survey Section 42, Abstract 558, and the Northwest corner of the A.A. Talmage Survey Section 36, Abstract 555;

THENCE South 87 deg. 04 min. 03 sec. West, along the South line of said 166.707 acre tract and the South line of the C.M. Hays Survey, Abstract 533 and the North line of the H.T. & B. R.R. Company Survey, Abstract 236, and the North line of the Archer Lake Inc. tract described in Volume 515, Page 329, Deed Records, a distance of 42.25 feet to a 1 inch iron pipe set for corner;

THENCE North 05 deg. 59 min. 34 sec. West, along the West edge of a seep ditch, at 100.0 feet pass a 1 inch iron pipe set and continue for a total distance of 1497.88 feet to a 1 inch iron pipe set for corner;

THENCE North 87 deg. 31 min. East, along the North line of said 166.707 acre tract and the South line of the Chang tract a distance of 121.0 feet to a 3/4 inch iron rod found for the Northeast corner of the herein described tract at the Northeast corner of said 166.707 acre tract in the East line of Abstract 533 and the West line of Abstract 558;

THENCE South 02 deg. 58 min. 46 sec. East, along the East line of said 166.707 acre tract and the common line of said surveys a distance of 1494.80 feet to the PLACE OF BEGINNING and containing 2.80 acres of land.



## Exhibit A

8.58 ACRES OF LAND, OUT OF THE C. M. HAYES SURVEY, SECTION 8, ABSTRACT 534, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF LOT 30 OF THE C. W. PALMER SUBDIVISION IN THE H.T. & B. R.R. COMPANY SURVEY, SECTION 9, ABSTRACT 238, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 29, PLAT RECORDS, AND ALSO BEING A PART OF THAT CERTAIN 117.742 ACRE TRACT DESCRIBED AS EXHIBIT "A" IN A BOUNDARY LINE AGREEMENT RECORDED IN VOLUME (85)226, PAGE 493, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 8.58 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod set for the Southeast corner of the herein described tract and the Southwest corner of a 74.33 acre tract this day surveyed in the South line of said 117.742 acre tract and the North line of the Claud Hamill tract described in Volume 1147, page 483, Deed Records, said point being located South 87 deg. 55 min. 39 sec. West - 1317.49 feet from a 3/4 inch iron rod found in the West right-of-way line of State Highway 288 (420.0 feet wide) at the Southeast corner of said 117.742 acre tract and the Northeast corner of the Hamill tract, said point also being at the intersection of the South line of the C. M. Hays Survey and the North line of the W. D. C. Hall Survey, Abstract 69, with the West right-of-way line of State Highway 288;

THENCE South 87 deg. 55 min. 39 sec. West, along the common line of said Surveys, the South line of said 117.742 acre tract, and the North line of the Hamill tract, a distance of 80.0 feet to a 3/4 inch iron rod found for the Southwest corner of the herein described tract at the Southwest corner of said 117.742 acre tract and the Southeast corner of the Warwick and Associates, Inc. tract described in Volume 1491, Page 702, Deed Records;

THENCE North 02 deg. 17 min. 08 sec. West, along the East line of the Warwick tract and the Agreed Boundary Line described in the above mentioned Exhibit "A", a distance of 1977.92 feet to a 3/4 inch iron rod found at the Northeast corner of the Warwick tract;

THENCE South 87 deg. 01 min. 23 sec. West, along the North line of the Warwick tract and the Agreed Boundary Line, a distance of 29.0 feet to a 1/2 inch iron rod set at the Southeast corner of a 37.54 acre tract this day surveyed;

THENCE North 00 deg. 27 min. 12 sec. West, along the East line of said 37.54 acre tract, at 660.05 feet pass a 1/2 inch iron rod set for reference corner, and continue for a total distance of 687.89 feet to the Northwest corner of the herein described tract and the Northeast corner of said 37.54 acre tract in the South line of the Linda Ruth Clark tract described in Volume 1320, Page 752, Deed Records;



THENCE North 86 deg. 37 min. 19 sec. East, along the South line of the Clark tract and the Randolph M. Henry tract described in Clerk's File 94-030029, a distance of 1273.45 feet to a point for corner in the West right-of-way line of State Highway 288;

THENCE South 09 deg. 10 min. 07 sec. East, along the West line of State Highway 288, a distance of 109.10 feet to a 1/2 inch iron rod set at the Northeast corner of the aforementioned 74.33 acre tract;

THENCE South 86 deg. 53 min. 47 sec. West, along the North line of said 74.33 acre tract, a distance of 1108.80 feet to a 1/2 inch iron rod set for angle point;

THENCE South 33 deg. 58 min. 17 sec. West, along a line of said 74.33 acre tract, a distance of 99.38 feet to a 1/2 inch iron rod set for angle point;

THENCE South 01 deg. 17 min. 30 sec. West, along the West line of said 74.33 acre tract, a distance of 550.12 feet to a 1/2 inch iron rod set for angle point;

THENCE South 04 deg. 58 min. 08 sec. East, along the West line of said 74.33 acre tract, a distance of 263.30 feet to a 1/2 inch iron rod set for angle point;

THENCE South 01 deg. 56 min. 57 sec. East, along the West line of said 74.33 acre tract, a distance of 1673.38 feet to the PLACE OF BEGINNING and containing 8.58 acres of land.

## EXHIBIT B

### PERMITTED ENCUMBRANCES

1. Any liens for taxes and assessments not yet delinquent.
2. Any obligations or duties reserved to or vested in any municipality or other governmental authority to regulate the Property in any manner.
3. Mechanics, materialmen's and similar liens for amounts not yet delinquent.
4. Rights-of-way, easements, use restrictions, encroachments or other similar encumbrances affecting the Property which do not materially adversely affect the use of the Property for its intended purpose.

RETURNED AT COUNTER TO:

GULF COAST WATER AUTHORITY

3630 Hwy 1765

TEXAS CITY TX 77591

**FILED AND RECORDED**

OFFICIAL PUBLIC RECORDS

*Dr. Dianne Wilson*

2007 Jul 17 10:55 AM

2007088487

DBC \$125.00

Dianne Wilson, Ph.D. COUNTY CLERK

FT BEND COUNTY TEXAS

Doc# 2007047929

# Pages 30

08/21/2007 2:47PM

Official Records of

BRAZORIA COUNTY

JOYCE HUDMAN

COUNTY CLERK

Fees \$132.00

*Joyce Hudman*



**SPECIAL WARRANTY DEED**

THE STATE OF TEXAS                   §  
  § ss: KNOW ALL PERSONS BY THESE PRESENTS:  
COUNTY OF FORT BEND               §

THAT **Chocolate Bayou Water Company**, a Delaware corporation, whose address is c/o International Paper Company, 6775 Lenox Center Court, Memphis, Tennessee, 38115 (hereinafter referred to as "**Grantor**") in consideration of the sum of Ten Dollars (\$10) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by its acceptance of this deed, has granted, bargained, sold, and conveyed and by these presents does hereby grant, bargain, sell and convey unto **Gulf Coast Water Authority**, a political subdivision of the State of Texas, whose address is 3630 Highway 1765, Texas City, Texas 77591 (hereinafter referred to as "**Grantee**"), all of the real property, together with improvements, if any, situated, lying and being in the County of Fort Bend, State of Texas as more particularly described as follows:

SEE EXHIBIT A ATTACHED HERETO AND MADE A PART HEREOF FOR ALL PURPOSES.

**TOGETHER** with all and singular the hereditaments and appurtenances thereto belonging, or in anywise appertaining, and all the estate, right, title and interest whatsoever of the Grantor either in law or in equity, of, in and to the above-described property ( the "**Property**").

Taxes for the current year shall be prorated to the Closing Date.

**TO HAVE AND TO HOLD** the Property unto Grantee, its successors and assigns, forever. The Grantor, for itself, its successors and assigns, does covenant and agree that it will WARRANT title to the Property to the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under Grantor, but not otherwise, subject (i) to the Permitted Encumbrances as set forth on Exhibit B attached hereto and (ii) all matters that a current survey or physical inspection of the Property would reveal.

**ANY COVENANTS OR WARRANTIES IMPLIED BY STATUTE OR LAW BY THE USE OF THE WORD "SELL," "ASSIGN," "TRANSFER," "CONVEY," OR OTHER WORDS OF GRANT ARE HEREBY EXPRESSLY WAIVED AND DISCLAIMED BY THE PARTIES. GRANTOR AND GRANTEE HEREBY AGREE THAT, TO THE EXTENT REQUIRED BY APPLICABLE LAW, THE DISCLAIMERS CONTAINED IN THIS ASSIGNMENT ARE "CONSPICUOUS" FOR THE PURPOSES OF SUCH APPLICABLE LAW, RULES, REGULATION OR ORDER.**

IN WITNESS WHEREOF, this instrument is executed this 13<sup>th</sup> day of December, 2006.

**GRANTOR:**

**Chocolate Bayou Water Company**

By: Allen D. Moore

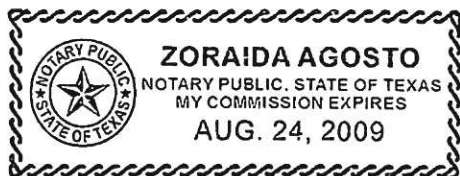
Name: ALLEN D. MOORE

Title: V - president

THE STATE OF TEXAS     §  
                                     §     ss:  
COUNTY OF HARRIS     §

The foregoing instrument was acknowledged before me this 13<sup>th</sup> day of December, 2006, by Allen D. Moore as Vice President of Chocolate Bayou Water Company, a Delaware corporation.

Zoraida Agosto  
Notary Public





**EXHIBIT "A"**

**TO**

**SPECIAL WARRANTY DEED**

**FROM**

**CHOCOLATE BAYOU WATER COMPANY ("GRANTOR")**

**TO**

**GULF COAST WATER AUTHORITY ("GRANTEE")**

**(Consisting of 17 Tracts of Land - each labeled Exhibit A)**

## EXHIBIT A

### Juliff Parcel 1

### FIELD NOTES

116.07 ACRES OF LAND, BEING A PART OF THE WILLIAM PETTUS LEAGUE, ABSTRACT 68, FORT BEND COUNTY, TEXAS, LYING WEST OF F. M. 521 AND EAST OF THE BRAZOS RIVER, AND BEING THAT CERTAIN TRACT DESCRIBED IN A DEED FROM A. M. MILLER TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 160, PAGE 411, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM J. D. EUBANK AND J. F. EUBANK TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 153, PAGE 399, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM J. F. EUBANK TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 209, PAGE 81, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM J. D. EUBANK AND J. F. EUBANK TO SOUTH TEXAS WATER COMPANY DATED FEBRUARY 10, 1941, AND DESCRIBED AS SAVE AND EXCEPT TRACT 2 IN VOLUME 209, PAGE 89, DEED RECORDS, SAID 116.07 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 2 inch iron pipe set for the Northeast corner of the herein described tract in the West right-of-way line of the Missouri-Pacific Railroad (abandoned) and the East line of the DMD Interests, LTD. 370.94 acre tract described in Clerk's File 980897, said point being the Northeast corner of the aforementioned Miller to South Texas Water Company tract, said point being located South 02 deg. 34 min. 33 sec. West - 2735.26 feet from a 3/4 inch iron pipe found at the intersection of the North line of the William Pettus League with the West right-of-way line of said railroad, which point is the Southeast corner of a 7454.008 acre tract described in Volume 951, Page 578, Deed Records, said Beginning Point having coordinates of

X = 3,121,386.58 and Y = 605,304.38;

THENCE South 02 deg. 34 min. 33 sec. West, along the West line of said railroad, a distance of 200.07 feet to a 2 inch iron pipe set for the Southeast corner of the herein described tract in the North right-of-way line of Miller Road, 80.0 feet wide as described in Volume 168, Page 72, Deed Records;

THENCE North 88 deg. 57 min. 11 sec. West, along the North line of Miller Road, a distance of 7224.95 feet to a 3/4 inch iron pipe set for angle point in the West right-of-way line of the abandoned Old Sugarland Railroad, said point being the Southeast corner of the aforementioned South Texas Water Company tract described in Volume 153, Page 399, Deed Records;

THENCE North 88 deg. 56 min. 12 sec. West, along the South line of said tract and the North line of Miller Road as described as Save and Except Tract 3 in Volume 209, Page 89, Deed Records, a distance of 465.01 feet to a 3/4 inch iron pipe set at the P.C. of a curve to the left;

THENCE continuing along the common line of said tracts, being the North line of Miller Road, following said curve to the left having a Radius = 1332.39 feet, Central Angle of 05 deg. 22 min. 45 sec., Chord Bearing and Distance of South 88 deg. 22 min. 26 sec. West - 125.04 feet, for an arc distance of 125.09 feet to a 3/4 inch iron pipe set at the P.T. of said curve;

THENCE South 85 deg. 41 min. 03 sec. West, along the common line of said tracts, being the North line of Miller Road, a distance of 3836.97 feet to a 3/4 inch iron pipe set at the P.C. of a curve to the right;

THENCE along the common line of said tracts, being the North line of Miller Road, following said curve to the right having a Radius = 1532.39 feet, Central Angle of 14 deg. 18 min. 58 sec., Chord Bearing and Distance of North 87 deg. 09 min. 28 sec. West - 381.89 feet, for an arc distance of 382.89 feet to a 3/4 inch iron pipe set at the P.T. of said curve;

THENCE North 79 deg. 59 min. 59 sec. West, along the common line of said tracts, being the North line of Miller Road, a distance of 5837.57 feet to a 3/4 inch iron pipe set for corner;

THENCE South 09 deg. 40 min. 01 sec. West, at 80.0 feet pass a 1/2 inch iron pipe found in the South line of Miller Road at the upper Northwest corner of the Shirley Strickland tract described in Volume 2270, Page 1540, Deed Records, and continue for a total distance of 146.88 feet to a 1/2 inch iron pipe found at an ell corner of the Strickland tract;

THENCE North 81 deg. 03 min. 13 sec. West, along a line of the Strickland tract, at 260.0 feet pass a 2 inch iron pipe set, and continue for a total distance of 304.70 feet to a point for corner on the Easterly bank of the Brazos River;

THENCE up the Easterly bank of the Brazos River the following courses and distances:

North 06 deg. 39 min. 47 sec. West - 187.73 feet,

North 13 deg. 18 min. 37 sec. East - 347.24 feet,

North 19 deg. 21 min. 25 sec. East - 140.37 feet,

North 05 deg. 15 min. 19 sec. East - 373.33 feet, and

North 04 deg. 46 min. 36 sec. West - 169.15 feet

to the Northwest corner of the herein described tract at the intersection of the North line of the Pettus League and the South line of the William Hall League, Abstract 31, with the East bank of the Brazos River;

THENCE North 86 deg. 50 min. 30 sec. East, along the common line of said Surveys, at 40.0 feet pass a 3/4 inch iron pipe found at the Southwest corner of the AFG Pacific Properties, Inc. 3927.662 acre tract described in Clerk's File 9537103, and continue along the South line of said tract for a total distance of 915.28 feet to a concrete monument found for corner at the Northwest corner of the AFG Pacific Properties, Inc. 305.661 acre tract described in Clerk's File 9562810;

THENCE South 09 deg. 59 min. 41 sec. West, along the West line of said 305.661 acre tract, a distance of 856.72 feet to a 5/8 inch iron rod found for corner;

THENCE South 80 deg. 00 min. 21 sec. East, along the South line of said 305.661 acre tract, a distance of 1499.78 feet to a 5/8 inch iron rod found for corner;

THENCE South 09 deg. 57 min. 38 sec. West, along a line of said tract, a distance of 169.99 feet to a 5/8 inch iron rod found for corner;

THENCE South 79 deg. 59 min. 59 sec. East, along the South line of said 305.661 acre tract, a distance of 3834.84 feet to a 5/8 inch iron rod found at the P.C. of a curve to the left;

THENCE continuing along the South line of said 305.661 acre tract, following said curve to the left having a Radius = 1302.39 feet, Central Angle of 14 deg. 18 min. 58 sec., Chord Bearing and Distance of South 87 deg. 09 min. 28 sec. East - 324.57 feet, for an arc distance of 325.42 feet to a 5/8 inch iron rod found at the P.T. of said curve;

THENCE North 85 deg. 41 min. 03 sec. East, along the South line of said 305.661 acre tract, a distance of 3836.97 feet to the P.C. of a curve to the right, from which point a 5/8 inch iron rod bears 0.50 feet Southwest;

THENCE along the South line of said 305.661 acre tract, following said curve to the right having a Radius = 1562.39 feet, Central Angle of 05 deg. 22 min. 45 sec., Chord Bearing and Distance of North 88 deg. 22 min. 26 sec. East - 146.63 feet, at 27.92 feet pass a concrete monument found, and continue for a total arc distance of 146.68 feet to a 5/8 inch iron rod found at the P.T. of said curve;

THENCE South 88 deg. 56 min. 12 sec. East, along the South line of said 305.661 acre tract, at 37.80 feet pass a concrete monument found, and continue for a total distance of 460.77 feet to a concrete monument found for corner in the West line of the Old Sugarland Railroad, being the Southeast corner of said 305.661 acre tract;

THENCE South 00 deg. 16 min. 45 sec. East, along the West line of said railroad and the West line of the DMD Interests, LTD. tract, a distance of 30.0 feet to a concrete monument found for corner, being the Northwest corner of the aforementioned Miller to South Texas Water Company tract;

THENCE South 88 deg. 57 min. 11 sec. East, along the North line of said tract, a distance of 7234.05 feet to the PLACE OF BEGINNING and containing 116.07 acres of land, of which 33.19 acres is included in the DMD Interests, LTD. 370.94 acre tract.

BEARING BASE: Texas State Plane Coordinate System - South Central Zone. Coordinates based on USGS "Missouri City Monument #7045" NAD 27. Distances are true ground distances. To convert to grid, multiply by 0.998868.

Juliff



## EXHIBIT A

### Juliff Parcel 2

### FIELD NOTES

191.19 ACRES OF LAND, BEING A PART OF THE WILLIAM PETTUS LEAGUE, ABSTRACT 68, FORT BEND COUNTY, TEXAS, AND ABSTRACT 714, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THE EMIGRATION LAND COMPANY SUBDIVISION RECORDED IN VOLUME 618, PAGE 725, DEED RECORDS OF FORT BEND COUNTY, TEXAS AND A PART OF THE HOUSTON FIG ORCHARD SUBDIVISION RECORDED IN VOLUME 1, PAGE 69, PLAT RECORDS OF FORT BEND COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED FROM HUFFMAN TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 178, PAGE 333, DEED RECORDS, ALL OF THAT CERTAIN TRACT DESCRIBED IN A DEED FROM DIXON TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 444, PAGE 130, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM PHELPS TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 379, PAGE 621, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM TIGNER TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 160, PAGE 413, DEED RECORDS, THAT CERTAIN TRACT DESCRIBED IN A DEED FROM OLIVE TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 178, PAGE 332, DEED RECORDS, AND THAT CERTAIN TRACT DESCRIBED IN A DEED FROM WHEATLEY TO SOUTH TEXAS WATER COMPANY RECORDED IN VOLUME 160, PAGE 415, DEED RECORDS, SAID 191.19 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 5/8 inch iron rod found for the Northwest corner of the herein described tract in the East right-of-way line of F. M. 521, said point being located South 02 deg. 34 min. 33 sec. West - 2735.26 feet and South 87 deg. 38 min. 39 sec. East - 216.76 feet from a 3/4 inch iron pipe found at the intersection of the North line of the William Pettus League with the West right-of-way line of the Missouri-Pacific Railroad (abandoned), which point is the Southeast corner of a 7454.008 acre tract described in Volume 951, Page 578, Deed Records, said Beginning Point having coordinates of

X = 3,121,603.13 and Y = 605,295.47;

THENCE South 87 deg. 27 min. 27 sec. East, along the South line of the Neuhaus tract described in Volume 574, Page 64, Deed Records, a distance of 1169.47 feet to a 3/4 inch iron pipe set for corner in the centerline of a 40.0 foot platted road and the West line of Lot 15, Emigration Land Company Subdivision;

THENCE North 02 deg. 50 min. 20 sec. West, along the West line of Lot 15, a distance of 40.72 feet to a 3/4 inch iron pipe set for corner at the Southwest corner of the Brigham tract described in Volume 1862, Page 975, Deed Records;

THENCE South 64 deg. 45 min. 19 sec. East, along the South line of the Brigham tract, a distance of 294.81 feet to a 3/4 inch iron pipe set for corner in the West line of the Fabian Valdez tract described in Volume 2500, Page 1181, Deed Records;

THENCE South 02 deg. 50 min. 59 sec. East, along the West line of the Valdez tract, a distance of 761.0 feet to a 2 inch iron pipe found at the Southwest corner of the Valdez tract;

THENCE North 86 deg. 56 min. 08 sec. East, along the South line of the Valdez tract, the Ben J. Darnell tract described in Volume 2500, Page 1169, Deed Records, and the Martinez and Saldana tract described in Volume 2500, Page 1191, Deed Records, a distance of 2399.46 feet to a 2 inch iron pipe set for corner at the Northwest corner of the Bartholomew tract described in Volume 2043, Page 906, Deed Records;

THENCE South 02 deg. 51 min. 02 sec. East, along the West line of the Bartholomew tract, a distance of 1197.35 feet to a 2 inch iron pipe set at the Southwest corner of the Bartholomew tract;

THENCE North 86 deg. 54 min. 42 sec. East, along the South line of the Bartholomew tract, at 660.0 feet pass a 2 inch iron pipe found at the Southeast corner of the Bartholomew tract and the Southwest corner of the Jose Martinez tract described in Clerk's File 94-029430, and continue along the South line of said tract for a total distance of 1477.0 feet to a 2 inch iron pipe found at the Southeast corner of said tract;

THENCE South 02 deg. 51 min. 02 sec. East a distance of 124.56 feet to a 3/4 inch iron pipe set for corner, being the Southeast corner of the aforementioned Wheatley to South Texas Water Company tract described in Volume 160, Page 415. Deed Records;

THENCE South 86 deg. 54 min. 42 sec. West, along the South line of said tract and the South line of the aforementioned Olive to South Texas Water Company tract described in Volume 178, Page 332, Deed Records, a distance of 1077.81 feet to a 2 inch iron pipe set for corner at the Northwest corner of Lot 35 and the Northeast corner of Lot 34 of the Houston Fig Orchard Subdivision;

THENCE South 02 deg. 53 min. 59 sec. East, along the East line of Lots 34 and 37 and the West line of Lots 35 and 36, a distance of 1307.24 feet to an old 2 inch iron pipe found at the Southeast corner of the Phelps to South Texas Water Company tract;

THENCE South 87 deg. 06 min. 01 sec. West, along the South line of said tract and the North line of the Caldwell tract described in Clerk's File 9749474, a distance of 687.20 feet to a 3/4 inch iron pipe set for corner in the East line of the Tigner to South Texas Water Company tract;

THENCE South 35 deg. 25 min. 18 sec. East, along the East line of said tract, a distance of 876.89 feet to a 2 inch iron pipe set at the P.C. of a curve to the right;

THENCE following said curve to the right having a Radius = 625.0 feet, Central Angle of 30 deg. 29 min. 32 sec., Chord Bearing and Distance of South 20 deg. 10 min. 32 sec. East - 328.71 feet, for an arc distance of 332.62 feet to a 2 inch iron pipe set at the P.T. of said curve;



THENCE South 04 deg. 55 min. 46 sec. East a distance of 23.88 feet to a 2 inch iron pipe set for the Southeast corner of the herein described tract in County Road 56;

THENCE South 87 deg. 10 min. 52 sec. West a distance of 150.10 feet to a 2 inch iron pipe set for corner;

THENCE North 04 deg. 55 min. 46 sec. West a distance of 18.36 feet to a 2 inch iron pipe set at the P.C. of a curve to the left;

THENCE following said curve to the left having a Radius = 475.0 feet, Central Angle of 30 deg. 29 min. 32 sec., Chord Bearing and Distance of North 20 deg. 10 min. 32 sec. West - 249.82 feet, for an arc distance of 252.79 feet to a 2 inch iron pipe set at the P.T. of said curve;

THENCE North 35 deg. 25 min. 18 sec. West a distance of 972.53 feet to a 3/4 inch iron pipe set for corner in the South line of the Phelps to South Texas Water Company tract;

THENCE South 87 deg. 06 min. 01 sec. West, along the South line of said tract, a distance of 2198.53 feet to a 2 inch iron pipe found for corner at the Southwest corner of Lot 45 and being in the East line of the Caldwell tract described in Clerk's File 9731874;

THENCE North 02 deg. 46 min. 16 sec. West, along the West line of the Phelps to South Texas Water Company tract and the East line of the Caldwell tract, at 684.93 feet pass a 1 inch iron pipe found at the Northeast corner of the Caldwell tract and the Southeast corner of the Ramon O. Bolua tract described in Volume 2670, Page 981, Deed Records, and continue along the East line of the Bolua tract for a total distance of 2619.63 feet to a 3/4 inch iron pipe found at the Northeast corner of said tract and the Southeast corner of the John E. Craig tract described in Clerk's File 9828363;

THENCE North 02 deg. 50 min. 20 sec. East, along the East line of the Craig tract and the East line of the Neuhaus tract, a distance of 659.55 feet to a 3/4 inch iron pipe set for corner;

THENCE North 87 deg. 27 min. 27 sec. West, along the North line of the Neuhaus tract, a distance of 1188.45 feet to a 3/4 inch iron pipe found in the East right-of-way line of F. M. 521;

THENCE North 02 deg. 34 min. 33 sec. East, along the East line of F. M. 521, a distance of 200.22 feet to the PLACE OF BEGINNING and containing 191.19 acres of land.

BEARING BASE: Texas State Plane Coordinate System - South Central Zone. Coordinates based on USGS "Missouri City Monument #7045" NAD 27. Distances are true ground distances. To convert to grid, multiply by 0.998868.

Juliff2

## EXHIBIT "A"

76.14 ACRES OF LAND, BEING A PART OF THE STEPHEN F. AUSTIN 1-3/4 LEAGUE GRANT, ABSTRACT 37, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 76.14 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod found for the Southeast corner of the herein described tract in the North line of the Rowan Townsite recorded in Volume 1, Page 59, Plat Records, and the North line of a 63.06 acre tract described in Volume 1498, Page 429, Deed Records, said point being the Southwest corner of a 528.56 acre tract described in a deed to Ricetec, Inc. recorded in Volume (90)780, Page 555, Official Records, said Beginning Point having Coordinates:

X = 3,189,755.28 and Y = 557,194.34;

THENCE North 87 deg. 43 min. 09 sec. West, along the North line of said 63.06 acre tract, at 868.17 feet pass a 2 inch iron pipe set for reference corner, and continue for a total distance of 918.17 feet to a point for corner on the Northeast waters edge of Chocolate Bayou;

THENCE, along the Northeast waters edge of Chocolate Bayou, upstream the following courses and distances:

North 18 deg. 28 min. 08 sec. West - 73.23 feet,  
North 47 deg. 13 min. 07 sec. West - 61.74 feet,  
North 75 deg. 25 min. 28 sec. West - 86.83 feet,  
South 80 deg. 20 min. 45 sec. West - 94.22 feet,  
South 60 deg. 26 min. 58 sec. West - 175.27 feet,  
South 67 deg. 29 min. 26 sec. West - 52.75 feet,  
North 41 deg. 43 min. 22 sec. West - 66.18 feet,  
North 03 deg. 20 min. 36 sec. East - 26.06 feet,  
North 05 deg. 34 min. 12 sec. East - 175.68 feet,  
North 13 deg. 00 min. 10 sec. West - 62.14 feet,  
North 40 deg. 45 min. 17 sec. West - 76.91 feet,  
North 44 deg. 33 min. 33 sec. West - 97.45 feet,  
North 61 deg. 30 min. 29 sec. West - 207.79 feet,  
North 42 deg. 39 min. 09 sec. West - 89.77 feet,  
North 39 deg. 41 min. 33 sec. West - 155.81 feet,  
North 26 deg. 37 min. 25 sec. West - 222.67 feet,  
North 31 deg. 02 min. 34 sec. West - 100.89 feet, and  
South 82 deg. 32 min. 29 sec. West - 60.20 feet

to a point for corner at the Southeast corner of the Walsh and Gibson 108.28 acre tract described in Clerk's File 94-004154, from which point a 2 inch iron pipe bears North 05 deg. 39 min. 56 sec. West - 73.4 feet;



THENCE along the Southeast boundary of said 108.28 acre tract the following courses and distances:

North 25 deg. 40 min. 19 sec. East - 150.50 feet,  
North 31 deg. 22 min. 52 sec. East - 158.42 feet,  
North 23 deg. 15 min. 21 sec. East - 152.65 feet,  
North 51 deg. 40 min. 38 sec. East - 192.22 feet,  
North 42 deg. 15 min. 08 sec. East - 226.11 feet,  
North 32 deg. 32 min. 07 sec. East - 84.48 feet,  
North 66 deg. 46 min. 41 sec. East - 15.0 feet,  
North 34 deg. 07 min. 48 sec. East - 264.68 feet, and  
North 37 deg. 09 min. 32 sec. East - 391.41 feet

to a point marking the most Westerly corner of the  
aforementioned Ricetec tract;

THENCE South 45 deg. 20 min. 51 sec. East, along a line of  
said Ricetec tract, at 145.58 feet pass a 1/2 inch iron rod  
found, and continue for a total distance of 290.27 feet to  
a 1/2 inch iron rod found for corner;

THENCE North 60 deg. 46 min. 54 sec. East, along a line of  
said Ricetec tract, a distance of 249.15 feet to a 1/2 inch  
iron rod found for corner at the West corner of an 11.89  
acre tract this day surveyed, which is also shown as Canal  
Area No. 1 in the aforementioned Ricetec deed;

THENCE South 42 deg. 42 min. 06 sec. East, along the  
Southwest line of said 11.89 acre tract, at 197.02 feet  
pass a 1/2 inch iron rod found at the South corner of said  
tract, and continue along a line of the Ricetec tract for a  
total distance of 641.52 feet to a 1/2 inch iron rod found  
for corner;

THENCE South 14 deg. 16 min. 28 sec. East, along a line of  
the Ricetec tract, a distance of 1556.91 feet to a 1/2 inch  
iron rod found for corner;

THENCE South 23 deg. 23 min. 05 sec. West, along a line of  
the Ricetec tract, a distance of 305.08 feet to the PLACE  
OF BEGINNING and containing 76.14 acres of land.

BEARING BASE: Texas State Plane Coordinate System - South  
Central Zone. Coordinates based on USGS "Liverpool" NAD  
27. Distances are true ground distances. To convert to  
grid, multiply by 0.999864.

## Exhibit A

11.89 ACRES OF LAND, BEING A PART OF THE STEPHEN F. AUSTIN 1-3/4 LEAGUE GRANT, ABSTRACT 37, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 11.89 ACRES ALSO BEING A PART OF THAT CERTAIN 12.39 ACRE TRACT DESCRIBED AS CANAL AREA NO. 1 IN A DEED TO RICETEC, INC. RECORDED IN VOLUME (90)780, PAGE 555, OFFICIAL RECORDS, SAID 11.89 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING at a 1/2 inch iron rod found for the Southeast corner of a 76.14 acre tract this day surveyed, in the North line of the Rowan Townsite recorded in Volume 1, Page 59, Plat Records, and the North line of a 63.06 acre tract described in Volume 1498, Page 429, Deed Records, said point being the Southwest corner of a 528.56 acre tract described in the aforementioned deed to Ricetec, Inc., said Commencing Point having Coordinates:

X = 3,189,755.28 and Y = 557,194.34;

THENCE North 23 deg. 23 min. 05 sec. East, along the common line of said 76.14 acre tract and the Ricetec tract, a distance of 305.08 feet to a 1/2 inch iron rod found;

THENCE North 14 deg. 16 min. 28 sec. West, along the common line of said 76.14 acre tract and the Ricetec tract, a distance of 1556.91 feet to a 1/2 inch iron rod found;

THENCE North 42 deg. 42 min. 06 sec. West, along the common line of said 76.14 acre tract and the Ricetec tract, a distance of 444.50 feet to a 1/2 inch iron rod found for the most Southerly corner of the herein described tract and also the PLACE OF BEGINNING, said point being the South corner of the aforementioned 12.39 acre tract;

THENCE North 42 deg. 42 min. 06 sec. West, along the Northeast line of said 76.14 acre tract, a distance of 197.02 feet to a 1/2 inch iron rod found at the West corner of said 12.39 acre tract;

THENCE North 60 deg. 46 min. 54 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 1931.71 feet to a 1/2 inch iron rod found for angle point;

THENCE North 43 deg. 54 min. 50 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 124.46 feet to a 1/2 inch iron rod found for angle point;

THENCE North 37 deg. 19 min. 47 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 391.84 feet to a 1/2 inch iron rod set for angle point;

THENCE North 40 deg. 42 min. 39 sec. East, along the Northwest line of said 12.39 acre tract, a distance of 214.88 feet to a 1/2 inch iron rod found in the Southwest right-of-way line of F. M. 2917;

THENCE in a Southeasterly direction, along the Southwest line of F. M. 2917, following a curve to the left having a Radius = 1970.08 feet, Central Angle of 06 deg. 09 min. 13 sec., Chord Bearing and Distance of South 29 deg. 38 min. 10 sec. East - 211.49 feet, for an arc distance of 211.59 feet to a 1/2 inch iron rod found for corner in the Southeast line of said 12.39 acre tract;

THENCE South 37 deg. 49 min. 54 sec. West, along the Southeast line of said 12.39 acre tract, a distance of 639.75 feet to a 1/2 inch iron rod found for angle point;

THENCE South 60 deg. 53 min. 05 sec. West, along the Southeast line of said 12.39 acre tract, a distance of 1978.60 feet to the PLACE OF BEGINNING and containing 11.89

## Exhibit A

10.49 ACRES OF LAND, BEING A PART OF THE STEPHEN F. AUSTIN 1-3/4 LEAGUE GRANT, ABSTRACT 37, AND THE HOOPER AND WADE SURVEY, SECTION 3, ABSTRACT 428, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 10.49 ACRES ALSO BEING A PART OF THAT CERTAIN 12.64 ACRE TRACT DESCRIBED AS CANAL AREA NO. 3 IN A DEED TO RICETEC, INC. RECORDED IN VOLUME (90)780, PAGE 555, OFFICIAL RECORDS, SAID 10.49 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 5/8 inch iron rod found for the Northwest corner of the herein described tract at the Northeast corner of a 0.57 acre tract surveyed by Baker and Lawson dated November 30, 2000, said point being in the South line of a 1.571 acre tract described in a Deed of Trust to Martin M. Molot recorded in Clerk's File 95-009938, said point being located South 84 deg. 04 min. 18 sec. East - 150.29 feet from a 1/2 inch iron rod found at the Southwest corner of said 1.571 acre tract, said Beginning Point having Coordinates:

X = 3,191,985.54 and Y = 561,585.49;

THENCE South 84 deg. 04 min. 18 sec. East, along the South line of said 1.571 acre tract, a distance of 11.46 feet to a 5/8 inch iron rod found for angle point;

THENCE North 78 deg. 18 min. 03 sec. East, along the South line of said 1.571 acre tract, a distance of 202.03 feet to a 5/8 inch iron rod found at the Southeast corner of said tract in a line of the aforementioned 12.64 acre tract;

THENCE South 02 deg. 22 min. 48 sec. East, along a line of said 12.64 acre tract, a distance of 17.62 feet to a 1/2 inch iron rod set for corner,

THENCE North 80 deg. 37 min. 59 sec. East, along the North line of said 12.64 acre tract, a distance of 899.91 feet to a 1/2 inch iron rod set in the common line of the Stephen F. Austin 1-3/4 League Grant, Abstract 37, and the Hooper and Wade Survey, Section 3, Abstract 428, said point being in the Southwest line of the Stacy Botter tract described in Volume 899, Page 188, Deed Records;

THENCE South 50 deg. 30 min. 46 sec. East, along the common line of said Surveys and the Southwest line of the Botter tract, being a line of said 12.64 acre tract, a distance of 87.35 feet to a 1/2 inch iron rod set for corner at the South corner of the Botter tract;

THENCE North 39 deg. 28 min. 09 sec. East, along the Southeast line of the Botter tract and the Northwest line of said 12.64 acre tract, a distance of 1279.29 feet to a 1/2 inch iron rod set for corner,

THENCE North 89 deg. 37 min. 41 sec. East, along a line of said 12.64 acre tract, a distance of 1600.88 feet to a 1/2 inch iron rod found for angle point;

THENCE South 54 deg. 59 min. 29 sec. East, along a line of said 12.64 acre tract, a distance of 110.31 feet to a 1/2 inch iron rod set at the East corner of said 12.64 acre tract in the Northwest right-of-way line of the Missouri-Pacific Railroad (100.0 feet wide);

THENCE South 39 deg. 26 min. 08 sec. West, along the Northwest line of said Railroad, a distance of 142.20 feet to a 1/2 inch iron rod set for corner,

THENCE North 55 deg. 26 min. 47 sec. West, along the Southwest line of said 12.64 acre tract, a distance of 100.66 feet to a 1/2 inch iron rod found for angle point;



THENCE South 89 deg. 05 min. 38 sec. West, along the South line of said 12.64 acre tract, a distance of 1521.40 feet to a 1/2 inch iron rod found for angle point;

THENCE South 41 deg. 13 min. 53 sec. West, along a line of said 12.64 acre tract, a distance of 1244.49 feet to a 1/2 inch iron rod found for angle point;

THENCE South 80 deg. 09 min. 19 sec. West, along the South line of said 12.64 acre tract, a distance of 780.26 feet to a 1/2 inch iron rod set for corner,

THENCE South 00 deg. 06 min. 28 sec. East, along a line of said 12.64 acre tract, a distance of 13.24 feet to a 1/2 inch iron rod found for corner,

THENCE South 84 deg. 13 min. 13 sec. West, along the South line of said 12.64 acre tract, a distance of 394.48 feet to a 5/8 inch iron rod found for corner at the Southeast corner of the aforementioned 0.57 acre tract;

THENCE North 02 deg. 21 min. 17 sec. East, along the East line of said 0.57 acre tract, a distance of 151.45 feet to the PLACE OF BEGINNING and containing 10.49 acres of land.



## Exhibit A

5.40 acres of land being a part of the C.M. Hays Survey, Abstract 533 and Abstract 536, Brazoria County, Texas and being a part of that certain 668.389 acre tract described in a release of Surface Rights recorded in Volume 1760, Page 488, Deed Records of Brazoria County, Texas and also being a part of that certain 166.707 acre tract described in a Substitute Trustee Deed of IP Farms, Inc. recorded in Volume (88)541, Page 105, Official Records, Brazoria County, Texas

and being more particularly described by metes and bounds as follows:

BEGINNING at a 1 inch iron pipe set for the Northwest corner of the herein described tract in the North line of said 166.707 acre tract and the South line of the S.M. Chang tract described in Volume 1760, Page 531, Deed Records, said point being located North 87 deg. 31 min. East - 55.0 feet from a 3/4 inch rod found in the East right-of-way line of State Highway 288 at the Northwest corner of said 166.707 acre tract and the Southwest corner of the Chang tract;

THENCE North 87 deg. 31 min. East, along the North line of said 166.707 acre tract and the South line of the Chang tract a distance of 101.32 feet to a 1 inch iron pipe set for corner;

THENCE South 02 deg. 27 min. 34 sec. East a distance of 1431.17 feet to a 1 inch iron rod set for corner;

THENCE North 87 deg. 04 min. 03 sec. East a distance of 677.82 feet to a 1 inch iron rod set for corner;

THENCE South 02 deg. 55 min. 57 sec. East a distance of 100.0 feet to a 3/8 inch iron rod found in the South line of said 166.707 acre tract and the North line of the H.T. & B. RR Company Survey, Section 7, Abstract 236;

THENCE South 87 deg. 04 min. 03 sec. West, along the South line of said 166.707 acre tract a distance of 844.03 feet to a 3/4 inch iron rod found for the Southwest corner of the herein described tract in the East right-of-way line of State Highway 288 (420.0 feet ROW as described in Volume 1207, Page 138, Deed Records) at the Southwest corner of said 166.707 acre tract;

THENCE along the East right-of-way line of State Highway 288, following a curve to the left, having a radius of 11,669.16 feet, central angle 00 deg. 40 min. 49 sec., Chord Bearing and distance North 01 deg. 08 min. 51 sec. West - 138.57 feet for an arc distance of 138.57 feet to a 1 inch iron pipe set for corner;

THENCE North 87 deg. 04 min. 03 sec. East a distance of 56.04 feet to a 1 inch iron pipe set for corner;

THENCE North 02 deg. 15 min. 36 sec. West a distance of 1393.52 feet to the PLACE OF BEGINNING and containing 5.40 acres of land.

## Exhibit A

2.41 ACRES OF LAND, BEING A PART OF LOT 400 OF THE EMIGRATION LAND COMPANY SUBDIVISION OF THE C. M. HAYES SURVEY, SECTION 2, ABSTRACT 531, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 113, PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN 6.667 ACRE TRACT DESCRIBED IN A SUBSTITUTE TRUSTEES DEED TO I.P. FARMS, INC. RECORDED IN VOLUME (87)415, PAGE 415, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 2.41 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a ½ inch iron rod set at the Northeast corner of Lot 400 and the Northeast corner of Section 2 at the intersection of the centerline of County Road 48 with the centerline of County Road 64;

THENCE South, along the East line of Section 2 and the West line of the W. H. Dennis Survey, Section 50, Abstract 512, a distance of 880.47 feet to a ½ inch iron rod set at the Southeast corner of Lot 400, from which point a ¾ inch iron rod bears 3.53 South and 3.32 West;

THENCE West, along the South line of Lot 400 and the North line of Lot 410, a distance of 94.65 feet to a ½ inch iron rod set for corner at the Southeast corner of a 4.37 acre tract this day surveyed;

THENCE North 00 deg. 05 min. 43 sec. East, along the East line of said 4.37 acre tract, a distance of 745.96 feet to a ½ inch iron rod set for angle point;

THENCE North 32 deg. 44 min. 09 sec. West, along a line of said 4.37 acre tract, a distance of 48.29 feet to a ½ inch iron rod set for angle point;

THENCE North 88 deg. 02 min. 35 sec. West, along the North line of said 4.37 acre tract, a distance of 215.74 feet to a ½ inch iron rod set at the Northwest corner of said 4.37 acre tract in the West line of Lot 400 and the East line of Lot 390 as described in a deed to Kay Bell recorded in Clerk's File 97-003320;

THENCE North 00 deg. 04 min. 37 sec. East, along the common line of Lots 390 and 400, a distance of 86.53 feet to a ½ inch iron rod set at the Northwest corner of Lot 400 and the Northeast corner of Lot 390 in the North line of Section 2, being in County Road 64;

THENCE East, along the North line of Section 2, a distance of 335.02 feet to the PLACE OF BEGINNING and containing 2.41 acres of land.

## Exhibit A

1129.43 ACRES OF LAND, BEING A PART OF THE EDMOND ANDREWS LEAGUE, ABSTRACT 5, AND THE PERRY AND AUSTIN LEAGUE, ABSTRACT 110, BRAZORIA COUNTY, TEXAS, AND BEING OUT OF THE TEXAS ORCHARD DEVELOPMENT COMPANY SUBDIVISION NO. 1 IN THE PERRY AND AUSTIN LEAGUE, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 49, PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 1129.43 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 5/8 inch iron rod with aluminum cap found for the East corner of the herein described tract and the South corner of the Petronillo Esquivel tract described in Clerk's File 98-038075, said point being located South 50 deg. 32 min. 17 sec. East - 83.92 feet from a 5 inch by 5 inch concrete monument found at the East corner of the Perry and Austin League, Abstract 110, said Beginning Point having Coordinates:

X = 3,217,503.33 and Y = 552,447.34;

THENCE South 35 deg. 42 min. West a distance of 113.37 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 38 deg. 53 min. 36 sec. West a distance of 541.07 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 51 deg. 19 min. 41 sec. West a distance of 1814.72 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 62 deg. 01 min. 43 sec. West a distance of 392.48 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 49 deg. 42 min. 04 sec. West a distance of 222.67 feet to a 3/4 inch iron pipe set for angle point;

THENCE South 55 deg. 12 min. 07 sec. West a distance of 3591.23 feet to a 3/4 inch iron pipe set for corner;

THENCE North 85 deg. 23 min. 15 sec. West a distance of 35.81 feet to a 3/4 inch iron pipe set for corner;

THENCE North 34 deg. 57 min. 57 sec. West a distance of 50.77 feet to a 3/4 inch iron pipe set for corner;

THENCE North 23 deg. 35 min. 31 sec. West a distance of 3072.52 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 23 deg. 42 min. 32 sec. West a distance of 7454.82 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 28 deg. 50 min. 25 sec. West a distance of 414.64 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 29 deg. 34 min. 29 sec. West a distance of 564.38 feet to a 3/4 inch iron pipe set for angle point;



THENCE North 45 deg. 20 min. 29 sec. West a distance of 1393.88 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 45 deg. 29 min. 06 sec. West a distance of 939.0 feet to a 3/4 inch iron pipe set for the most Westerly corner of the herein described tract;

THENCE North 44 deg. 30 min. 54 sec. East a distance of 390.56 feet to a 3/4 inch iron pipe set for corner;

THENCE North 00 deg. 57 min. 36 sec. West a distance of 1004.76 feet to a 3/4 inch iron pipe set for the most Northerly corner of the herein described tract in the Northeast line of the Perry and Austin League and the Southwest line of the H.T.& B. R.R. Company Survey, Section 3, Abstract 220, and the Southwest line of a 13.89 acre tract described in Clerk's File 93-018755;

THENCE South 50 deg. 32 min. 17 sec. East, along the Northeast line of the Perry and Austin League, the Southwest line of Section 3, the Southwest line of said 13.89 acre tract, the Southwest line of the Charles O'Donnell Survey, Section 2, Abstract 492, the Southwest line of the W. J. Palmer tract described in Volume 760, Page 411, Deed Records, the Southwest line of the S. M. Schleicher tract described in Volume 433, Page 438, Deed Records, the Southwest line of the F. R. Oldham tract described in Volume 216, Page 311, Deed Records, passing the South corner of Section 2 and the West corner of the A. G. Reynolds Survey, Abstract 121, and continue along the Southwest line of the Reynolds Survey, the First National Bank of Minneapolis tract described in Volume 838, Page 636, Deed Records, the J. G. Jackson tract described in Volume 290, Page 12, Deed Records, the Randy J. Sims tract described in Volume (91)897, Page 306, Official Records, the Decker and Brady tract described in Volume 1742, Page 792, Deed Records, the Margaret P. Clouser tract described in Volume 1742, Page 792, Deed Records, and the Esquivel tract for a total distance of 14847.21 feet to the PLACE OF BEGINNING and containing 1129.43 acres of land, less and except that certain 20.0 acre tract known as Lots 8 and 9,

Block 17, of the Texas Orchard Development Company Subdivision No. 1 described in a Quit Claim Deed to C. S. McCoy recorded in Volume 1454, Page 327, Deed Records, and a Warranty Deed to Harlow Royalties, Inc. recorded in Volume 1372, Page 219, Deed Records, leaving a net acreage of 1109.43 acres of land.



Exhibit A

34.41 ACRES OF LAND, BEING A PART OF TRACT 70 OF THE STEPHEN F. AUSTIN 1 3/4 LEAGUE, ABSTRACT 37, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 34.41 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1 inch iron pipe found for the Northwest corner of the herein described tract in the Southwest line of the Missouri-Pacific Railroad 90.0 foot Easement described in Volume 796, Page 288, Deed Records, said point being the Northeast corner of a 51.06 acre tract described in a deed from IP Farms to J. Curtis DuPriest recorded in Clerk's File 00-002612;

THENCE South 50 deg. 31 min. 51 sec. East, along the Southwest line of said railroad easement, at 45.23 feet pass the Southwest corner of the Duck Lake Lateral North Easement this day surveyed, at 221.54 feet pass the Southeast corner of said easement, and continue for a total distance of 4848.21 feet to a 1/2 inch iron rod set for corner;

THENCE South 04 deg. 52 min. 16 sec. West a distance of 74.66 feet to a 1/2 inch iron rod set for corner in the North line of a 60.0 foot road easement;

THENCE North 85 deg. 07 min. 44 sec. West a distance of 388.89 feet to a 1/2 inch iron rod set for corner;

THENCE South 39 deg. 28 min. 09 sec. West a distance of 51.45 feet to a 5/8 inch iron rod with aluminum cap found for corner at the East corner of a 20.0 acre tract known as Tract 71 described in Volume 96, Page 346, Deed Records, said point being an ell corner of Parcel 34, Tract 1;

THENCE North 50 deg. 31 min. 51 sec. West, along a line of Parcel 34, Tract 1, and the Northeast line of Tracts 71 and 72 of the Austin League, being the Northeast line of said 20.0 acre tract, the Mortensen tract described in Volume 748, Page 634, Deed Records, the Mortensen tract described in Volume 1118, Page 56, Deed Records, and the Peterson tract described in Volume 636, Page 290, Deed Records, a distance of 4089.52 feet to a 1 inch iron pipe found at the upper Southeast corner of the aforementioned 51.06 acre tract;

THENCE North 15 deg. 46 min. 29 sec. West, along a line of said 51.06 acre tract, a distance of 585.63 feet to the PLACE OF BEGINNING and containing 34.41 acres of land.

## Exhibit A

30.10 ACRES OF LAND, BEING A PART OF THE PERRY AND AUSTIN LEAGUE, ABSTRACT 110, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 30.10 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod inside a 1 inch PVC pipe found in the Northwest line of the Perry and Austin League, Abstract 110, said point being the most Easterly North corner of a 54.69 acre tract described in a deed to Kent R. Lynch recorded in Clerk's File 96-003162, said Beginning Point having Coordinates:

X = 3,198,525.96 and Y = 564,777.70;

THENCE North 39 deg. 28 min. 09 sec. East, along the Northwest line of Abstract 110, a distance of 930.09 feet to a 3/4 inch iron pipe set for the North corner of the herein described tract and the West corner of a Canal Easement of varying widths this day surveyed;

THENCE South 35 deg. 17 min. 38 sec. East a distance of 486.93 feet to a 1/2 inch iron rod set for corner;

THENCE South 31 deg. 04 min. 56 sec. East a distance of 352.62 feet to a 1/2 inch iron rod set for corner;

THENCE South 37 deg. 25 min. 22 sec. West a distance of 2059.95 feet to a 3/4 inch iron pipe set for corner;

THENCE North 89 deg. 12 min. 13 sec. West a distance of 152.72 feet to a 1/2 inch iron rod set for corner at the East corner of a Canal Easement of varying widths this day surveyed;

THENCE North 33 deg. 16 min. 29 sec. West, with a line of said easement, a distance of 146.76 feet to a 1/2 inch iron rod found for corner in the Southeast line of the aforementioned 54.69 acre Lynch tract;

THENCE North 68 deg. 26 min. 35 sec. East, along the Southeast line of the Lynch tract, a distance of 129.69 feet to a 1/2 inch iron rod found for corner;

THENCE North 14 deg. 46 min. 30 sec. East, along the Southeast line of the Lynch tract, a distance of 1444.46 feet to a 1/2 inch iron rod found for corner;

THENCE North 50 deg. 31 min. 51 sec. West, along the Northeast line of the Lynch tract, a distance of 75.84 feet to the PLACE OF BEGINNING and containing 30.10 acres of land.



Exhibit A

11.15 ACRES OF LAND, BEING A PART OF THE WEST 1/2 OF THE WEST 1/2 OF THE H.T. & B. R.R. COMPANY SURVEY, SECTION 10, ABSTRACT 535, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THOSE CERTAIN TRACTS DESCRIBED IN A DEED FROM GENERAL CRUDE OIL COMPANY TO IP FARMS, INC. RECORDED IN VOLUME 1465, PAGE 645, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 2 inch iron pipe set for the Northwest corner Section 10 in the South line of the Lavaca Navigation Co. Survey, Section 11, Abstract 327, said point being located North 00 deg. 06 min. 42 sec. West - 68.48 feet from the Northeast corner of Oak Meadows Estates according to the plat recorded in Volume 17, Pages 175-176, Plat Records;

THENCE North 89 deg. 53 min. 36 sec. East, along the North line of Abstract 535 and the South line of Abstract 327 and the South line of the Lavaca Navigation Co. Survey, Section 12, Abstract 536, a distance of 4101.50 feet to a 2 inch iron pipe set for the Northeast corner of this tract and the Northwest corner of the South Freeway, LTD. tract recorded in Volume 1186, Page 622, Deed Records;

THENCE South 00 deg. 33 min. 28 sec. West, along the West line of the South Freeway, LTD. tract, a distance of 80.0 feet to a 1 inch iron pipe set for corner at the Northeast corner of a 63.96 acre tract (Tract "B") this day surveyed;

THENCE South 89 deg. 53 min. 36 sec. West, along the North line of Tract "B", at 358.53 feet pass a 1 inch iron pipe set in the West line of County Road 48, at 2090.85 feet pass a 1 inch iron pipe set at the Northwest corner of Tract "B" and the Northeast corner of a 121.14 acre tract (Tract "A") this day surveyed and continue along the North line of Tract "A" for a total distance of 1939.71 feet to a 1 inch iron pipe set for the Northwest corner of Tract "A";

THENCE South 00 deg. 06 min. 42 sec. East, along the West line of Tract "A", a distance of 1952.13 feet to a 1 inch iron pipe set for angle point;

THENCE South 09 deg. 29 min. 30 sec. East, along the West line of Tract "A", a distance of 112.46 feet to a 1 inch iron pipe set for angle point;

THENCE South 01 deg. 24 min. 20 sec. East, along the West line of Tract "A", a distance of 134.65 feet to a 1 inch iron pipe set for corner in the North line of a 10.0 acre tract described in Volume (89)737, Page 442, Official Records;

THENCE South 89 deg. 51 min. 44 sec. West, along the North line of said 10.0 acre tract, at 28.66 feet pass the Northwest corner of said tract and continue for a total distance of 91.38 feet to a point for corner in the West line of Abstract 535 and the East line of the Andrew Robinson League, Abstract 125;

THENCE North 00 deg. 06 min. 42 sec. West, along the West line of Abstract 535 and the East line of the Robinson League and the East line of Oak Meadows Estates, for a distance of 2277.74 feet to the PLACE OF BEGINNING and containing 11.15 acres of land.



## Exhibit A

13.63 ACRES OF LAND BEING A PART OF LOT 7 OF THE STERN SUBDIVISION OF THE JOSHUA ABBOTT LEAGUE, ABSTRACT 144, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 74, PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED AS PARCEL 54 IN A DEED TO IP FARMS, INC., RECORDED IN VOLUME 1465, PAGE 645, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS;

BEGINNING at a 1 inch iron pipe set in the North line of Lot 7 at the Northwest corner of a 135.07 acre tract this day surveyed, said point being located South 86 deg. 10 min. 54 sec. West - 1110.12 feet from a 1 inch iron pipe set at the Northeast corner of Lot 7 of the Stern Subdivision and the Northwest corner of a 104.41 acre tract described in a deed to G. E. Wrightstone recorded in Volume 1302, Page 58, Deed Records, said BEGINNING point being in the South line of Lot 15 of the Bosler Subdivision as recorded in Volume 1, Page 88, Plat Records, and the South line of the Gerald W. Evers tract recorded in Volume 1521, Page 660, Deed Records;

THENCE South 86 deg. 10 min. 54 sec. West, along the North line of Lot 7 and the South line of Lots 15 & 16, Bosler Subdivision, a distance of 310.11 feet to a 1 inch iron pipe set at the Northwest corner of Lot 7 and the Northeast corner of Lot 6, Stern Subdivision;

THENCE South 03 deg. 56 min. 53 sec. East, along the West line of Lot 7 and the East line of Lot 6, at 16.37 feet pass a 1/2 inch iron rod found at the Northeast corner of the Albert J. Pekar tract as described in Clerk's File 93-044131 and continue along the common line of Lots 6 & 7 and the East line of the Albert J. Pekar tract, the East line of the Tina Pekar tract described in Clerk's File 94-001652, and the East line of the Allen R. Pekar tract described in Clerk's File 93-044132 for a distance of 3554.38 feet to a 1/2 inch iron rod found for angle point;

THENCE South 04 deg. 14 min. 29 sec. East, along the East line of the Allen R. Pekar tract, at 971.34 feet pass a 1/2 inch iron-rod found for reference corner and continue for a total distance of 1027.70 feet to the Southwest corner of Lot 7 in County Road 45 (80.0 feet wide);

THENCE North 85 deg. 52 min. 52 sec. East, along the South line of Lot 7, a distance of 119.77 feet to a point marking the Southeast corner of this tract and the Southwest corner of said 135.07 acre tract;

THENCE North 04 deg. 00 min. 40 sec. West, along the West line of said 135.07 acre tract, at 56.11 feet pass a 1 inch iron pipe set for reference corner and continue for a total distance of 4244.66 feet to a 1 inch iron pipe set for angle point;

THENCE North 26 deg. 15 min. 16 sec. East, along the West line of said 135.07 acre tract, a distance of 282.55 feet to a 1 inch iron pipe set for angle point;

THENCE North 86 deg. 10 min. 54 sec. East, along a line of said 135.07 acre tract, a distance of 47.40 feet to a 1 inch iron pipe set for corner;

THENCE North 03 deg. 49 min. 06 sec. West, along a line of said 135.07 acre tract, a distance of 92.26 feet to the PLACE OF BEGINNING and containing 13.63 acres of land.



## Exhibit A

1.01 ACRES OF LAND, BEING A PART OF THE PERRY AND AUSTIN SURVEY, ABSTRACT 109, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 34, TRACT 1, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 1.01 ACRE TRACT BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING at a 5/8 inch iron rod with aluminum cap found for the East corner of a 1129.43 acre tract this day surveyed and the South corner of the Petronillo Esquivel tract described in Clerk's File 98-038075, said point being located South 50 deg. 32 min. 17 sec. East - 83.92 feet from a 5 inch by 5 inch concrete monument found at the East corner of the Perry and Austin League, Abstract 110, said Commencing Point having Coordinates:

X = 3,217,503.33 and Y = 552,447.34,  
from said Commencing Point the following courses and distances are coincident with the Northeast line of a 100.0 foot Canal Easement and a Canal Easement of varying widths this day surveyed;

THENCE North 39 deg. 53 min. 18 sec. East, along the South line of the Esquivel tract, a distance of 24.90 feet to a 1/2 inch iron rod set for corner;

THENCE South 53 deg. 01 min. 17 sec. East a distance of 147.94 feet to an angle point;

THENCE South 48 deg. 03 min. 05 sec. East a distance of 2609.38 feet to an angle point;

THENCE South 47 deg. 55 min. 37 sec. East a distance of 4506.75 feet to an angle point;

THENCE South 56 deg. 27 min. 12 sec. East a distance of 91.62 feet to an angle point;

THENCE South 62 deg. 00 min. 09 sec. East a distance of 3067.95 feet to an angle point;

THENCE South 82 deg. 25 min. 25 sec. East a distance of 127.99 feet to an angle point;

THENCE South 87 deg. 43 min. 43 sec. East a distance of 811.94 feet to an angle point;

THENCE South 80 deg. 53 min. 19 sec. East a distance of 228.53 feet to a 1/2 inch iron rod set for the West corner of the varying width Canal Easement;

THENCE North 38 deg. 59 min. 34 sec. East a distance of 1488.15 feet to an angle point;

THENCE North 40 deg. 11 min. 06 sec. East a distance of 2539.98 feet to an angle point;

THENCE North 44 deg. 15 min. 22 sec. East a distance of 405.52 feet to a 3/4 inch iron rod set for the North corner of said easement and the PLACE OF BEGINNING of the herein described tract, said Beginning Point having Coordinates:

X = 3,229,729.25 and Y = 549,425.16;

THENCE North 43 deg. 10 min. 56 sec. West a distance of 14.19 feet to a point for corner on the Southerly bank of Hall's Bayou;

THENCE along the Southerly bank of Hall's Bayou the following courses and distances:

North 69 deg. 42 min. 21 sec. East - 97.13 feet,

North 80 deg. 12 min. 04 sec. East - 84.07 feet,

North 52 deg. 22 min. 47 sec. East - 34.79 feet,

South 87 deg. 45 min. 39 sec. East - 66.08 feet, and

South 80 deg. 34 min. 24 sec. East - 153.11 feet

to a point for corner in the centerline of a drainage ditch;

THENCE up the centerline of said drainage ditch the following courses and distances:

South 34 deg. 49 min. 09 sec. West - 61.48 feet,

South 81 deg. 13 min. 59 sec. West - 94.46 feet,

South 66 deg. 28 min. 25 sec. West - 46.31 feet, and

South 36 deg. 33 min. 08 sec. West - 150.0 feet

to a 3/4 inch iron pipe set for corner;

THENCE North 48 deg. 39 min. 11 sec. West a distance of 46.69 feet to a 3/4 inch iron pipe set at the East corner of the aforementioned varying width Canal Easement;

THENCE North 43 deg. 10 min. 56 sec. West, along the Northeast line of said easement, a distance of 166.07 feet to the PLACE OF BEGINNING and containing 1.01 acres of land.



## Exhibit A

187.40 ACRES OF LAND, BEING A PART OF THE DAY LAND AND CATTLE COMPANY SURVEY, ABSTRACT 601, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN TRACT DESCRIBED IN A DEED TO IP FARMS AS PARCEL 26, TRACT 2, RECORDED IN VOLUME 1769, PAGE 350, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 187.40 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod set for the Northeast corner of the herein described tract, said point being located North 59 deg. 56 min. 42 sec. East - 36.22 feet from a 1/2 inch iron rod found at an ell corner of Abstract 601 and the Southeast corner of the H.T. & B. R.R. Company Survey, Section 16, Abstract 518, Brazoria County, Texas, and also the Southeast corner of a certain 81.12 acre tract described in a deed to Wildlife Lakes, L.L.C. recorded in Clerk's File 99-019065, said Beginning Point having Coordinates:

X = 3,178,856.41 and Y = 545,607.40;

THENCE South 30 deg. 25 min. 04 sec. East a distance of 1740.17 feet to a 3/4 inch iron pipe set for corner;

THENCE South 42 deg. 26 min. 48 sec. West a distance of 16.30 feet to a 3/4 inch iron pipe set for corner;

THENCE South 30 deg. 51 min. 49 sec. East a distance of 560.64 feet to a 3/4 inch iron pipe set for corner in the Northwest right-of-way line of the St. Louis, Brownsville, and Mexico Railroad (100.0 feet wide);

THENCE South 39 deg. 25 min. 36 sec. West, along the Northwest line of said railroad, a distance of 3041.20 feet to a 3/4 inch iron pipe set for corner;

THENCE North 31 deg. 56 min. 13 sec. West a distance of 663.58 feet to a 3/4 inch iron pipe set for angle point;

THENCE North 30 deg. 12 min. 49 sec. West a distance of 2708.35 feet to 3/4 inch iron pipe set for corner in the North line of Abstract 601 and the South line of Section 16;

THENCE North 59 deg. 56 min. 42 sec. East, along the common line of said Surveys, at 1421.10 feet pass an old 1 inch iron pipe found at the Southwest corner of the aforementioned 81.12 acre tract, at 2837.57 feet pass the first mentioned 1/2 inch iron rod at the Southeast corner of said tract, and continue for a total distance of 2874.18 feet to the PLACE OF BEGINNING and containing 187.40 acres of land.

BEARING BASE: Texas State Plane Coordinate System - South Central Zone. Coordinates based on USGS "Liverpool" NAD 27. Distances are true ground distances. To convert to grid, multiply by 0.999864.

## Exhibit A

FIELD NOTES OF A 7.82 ACRE TRACT OUT OF LOT 6 OF THE BOSLER SUBDIVISION OF THE JOSHUA ABBOTT SURVEY, ABSTRACT 144, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 1, PAGE 88 OF THE PLAT RECORDS OF BRAZORIA COUNTY, TEXAS, AND BEING A PORTION OF THAT SAME PROPERTY CONVEYED BY DEED DATED DECEMBER 15, 1948, FROM D.M. HAVLIC TO THE SOUTH TEXAS WATER COMPANY, RECORDED IN VOLUME 442, PAGE 442 THROUGH 444 OF THE DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND SAID 7.82 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at a 3/4" iron rod found marking the Northeast corner of Lot 7 of the Bosler Subdivision in the Joshua Abbott Survey;

THENCE; South 88°53'35" West 1536.19 feet, along the North line of said Lot 7, to a 3/4" iron rod found marking the Northwest corner of said Lot 7 and the Northeast corner of Lot 6 of the Bosler Subdivision;

THENCE; South 88°57'45" West 1354.28 feet, along the North line of said Lot 6, to a 1/2" iron rod set for the place of beginning of the herein described tract;

THENCE; South 0°15'56" West 2271.87 feet to a 1/2" iron rod set for corner in the North right-of-way line of County Road 49;

THENCE; South 88°55'55" West 115.00 feet, along the North right-of-way line of County Road 49, to a 1/2" iron rod set for corner at the Southwest corner of said Lot 6;

THENCE; North 1°30' West, at 2267.22 feet pass a 1/2" iron rod set on line along the West line of said Lot 6, continue to a total distance of 2271.42 feet to a point for corner at the Northwest corner of said Lot 6;

THENCE; North 88°57'45" East 185.00 feet, along the North line of said Lot 6, to the place of beginning.

Said tract therein containing 7.82 acres of land.



## Exhibit A

2.80 ACRES OF LAND BEING A PART OF THE C.M. HAYS SURVEY, ABSTRACT 533, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF THAT CERTAIN 668.389 ACRE TRACT DESCRIBED IN A RELEASE OF SURFACE RIGHTS RECORDED IN VOLUME 1760, PAGE 488, DEED RECORDS OF BRAZORIA COUNTY, TEXAS, AND ALSO BEING A PART OF THAT CERTAIN 166.707 ACRE TRACT DESCRIBED IN A SUBSTITUTE TRUSTEE DEED TO IP FARMS, INC. RECORDED IN VOLUME (88)541, PAGE 105, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS SAID 2.80 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 3/4 inch iron rod found for the Southeast corner of the herein described tract at the Southeast corner of said 166.707 acre tract and the Southeast corner of Abstract 533, the Northeast corner of Abstract 236, the Southwest corner of the A.A. Talmage Survey Section 42, Abstract 558, and the Northwest corner of the A.A. Talmage Survey Section 36, Abstract 555;

THENCE South 87 deg. 04 min. 03 sec. West, along the South line of said 166.707 acre tract and the South line of the C.M. Hays Survey, Abstract 533 and the North line of the H.T. & B. R.R. Company Survey, Abstract 236, and the North line of the Archer Lake Inc. tract described in Volume 515, Page 329, Deed Records, a distance of 42.25 feet to a 1 inch iron pipe set for corner;

THENCE North 05 deg. 59 min. 34 sec. West, along the West edge of a seep ditch, at 100.0 feet pass a 1 inch iron pipe set and continue for a total distance of 1497.88 feet to a 1 inch iron pipe set for corner;

THENCE North 87 deg. 31 min. East, along the North line of said 166.707 acre tract and the South line of the Chang tract a distance of 121.0 feet to a 3/4 inch iron rod found for the Northeast corner of the herein described tract at the Northeast corner of said 166.707 acre tract in the East line of Abstract 533 and the West line of Abstract 558;

THENCE South 02 deg. 58 min. 46 sec. East, along the East line of said 166.707 acre tract and the common line of said surveys a distance of 1494.80 feet to the PLACE OF BEGINNING and containing 2.80 acres of land.

## Exhibit A

8.58 ACRES OF LAND, OUT OF THE C. M. HAYES SURVEY, SECTION 8, ABSTRACT 534, BRAZORIA COUNTY, TEXAS, AND BEING A PART OF LOT 30 OF THE C. W. PALMER SUBDIVISION IN THE H.T.& B. R.R. COMPANY SURVEY, SECTION 9, ABSTRACT 238, BRAZORIA COUNTY, TEXAS, ACCORDING TO THE PLAT RECORDED IN VOLUME 2, PAGE 29, PLAT RECORDS, AND ALSO BEING A PART OF THAT CERTAIN 117.742 ACRE TRACT DESCRIBED AS EXHIBIT "A" IN A BOUNDARY LINE AGREEMENT RECORDED IN VOLUME (85)226, PAGE 493, OFFICIAL RECORDS OF BRAZORIA COUNTY, TEXAS, SAID 8.58 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at a 1/2 inch iron rod set for the Southeast corner of the herein described tract and the Southwest corner of a 74.33 acre tract this day surveyed in the South line of said 117.742 acre tract and the North line of the Claud Hamill tract described in Volume 1147, page 483, Deed Records, said point being located South 87 deg. 55 min. 39 sec. West - 1317.49 feet from a 3/4 inch iron rod found in the West right-of-way line of State Highway 288 (420.0 feet wide) at the Southeast corner of said 117.742 acre tract and the Northeast corner of the Hamill tract, said point also being at the intersection of the South line of the C. M. Hays Survey and the North line of the W. D. C. Hall Survey, Abstract 69, with the West right-of-way line of State Highway 288;

THENCE South 87 deg. 55 min. 39 sec. West, along the common line of said Surveys, the South line of said 117.742 acre tract, and the North line of the Hamill tract, a distance of 80.0 feet to a 3/4 inch iron rod found for the Southwest corner of the herein described tract at the Southwest corner of said 117.742 acre tract and the Southeast corner of the Warwick and Associates, Inc. tract described in Volume 1491, Page 702, Deed Records;

THENCE North 02 deg. 17 min. 08 sec. West, along the East line of the Warwick tract and the Agreed Boundary Line described in the above mentioned Exhibit "A", a distance of 1977.92 feet to a 3/4 inch iron rod found at the Northeast corner of the Warwick tract;

THENCE South 87 deg. 01 min. 23 sec. West, along the North line of the Warwick tract and the Agreed Boundary Line, a distance of 29.0 feet to a 1/2 inch iron rod set at the Southeast corner of a 37.54 acre tract this day surveyed;

THENCE North 00 deg. 27 min. 12 sec. West, along the East line of said 37.54 acre tract, at 660.05 feet pass a 1/2 inch iron rod set for reference corner, and continue for a total distance of 687.89 feet to the Northwest corner of the herein described tract and the Northeast corner of said 37.54 acre tract in the South line of the Linda Ruth Clark tract described in Volume 1320, Page 752, Deed Records;



THENCE North 86 deg. 37 min. 19 sec. East, along the South line of the Clark tract and the Randolph M. Henry tract described in Clerk's File 94-030029, a distance of 1273.45 feet to a point for corner in the West right-of-way line of State Highway 288;

THENCE South 09 deg. 10 min. 07 sec. East, along the West line of State Highway 288, a distance of 109.10 feet to a 1/2 inch iron rod set at the Northeast corner of the aforementioned 74.33 acre tract;

THENCE South 86 deg. 53 min. 47 sec. West, along the North line of said 74.33 acre tract, a distance of 1108.80 feet to a 1/2 inch iron rod set for angle point;

THENCE South 33 deg. 58 min. 17 sec. West, along a line of said 74.33 acre tract, a distance of 99.38 feet to a 1/2 inch iron rod set for angle point;

THENCE South 01 deg. 17 min. 30 sec. West, along the West line of said 74.33 acre tract, a distance of 550.12 feet to a 1/2 inch iron rod set for angle point;

THENCE South 04 deg. 58 min. 08 sec. East, along the West line of said 74.33 acre tract, a distance of 263.30 feet to a 1/2 inch iron rod set for angle point;

THENCE South 01 deg. 56 min. 57 sec. East, along the West line of said 74.33 acre tract, a distance of 1673.38 feet to the PLACE OF BEGINNING and containing 8.58 acres of land.

## EXHIBIT B

### PERMITTED ENCUMBRANCES

1. Any liens for taxes and assessments not yet delinquent.
2. Any obligations or duties reserved to or vested in any municipality or other governmental authority to regulate the Property in any manner.
3. Mechanics, materialmen's and similar liens for amounts not yet delinquent.
4. Rights-of-way, easements, use restrictions, encroachments or other similar encumbrances affecting the Property which do not materially adversely affect the use of the Property for its intended purpose.

RETURNED AT COUNTER TO:

Gulf Coast Water Authority

3630 Highway 1765

Texas City, Texas 77591

**FILED AND RECORDED**

OFFICIAL PUBLIC RECORDS

*Dr. Dianne Wilson*

2007 Jul 10 10:17 AM

2007085339

LJ \$125.00

Dianne Wilson, Ph.D. COUNTY CLERK

FT BEND COUNTY TEXAS



**Document 5-3(b)**

General Land Office Easement

# The State of Texas



Austin, Texas

## MISCELLANEOUS EASEMENT (PIPELINES) ME20070011

STATE OF TEXAS

§  
§  
§

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND

This Miscellaneous Easement (the "Agreement"), ME20070011, is granted by virtue of the authority granted in Section 51.291, *et seq.*, TEX. NAT. RES. CODE ANN. (Vernon 2001), 31 TEX. ADMIN. CODE §13.11, *et seq.*, and all other applicable statutes and rules, as the same exist on the date hereof or as they may be amended from time to time.

### ARTICLE I. PARTIES

1.01. In consideration of the mutual covenants and agreements set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the STATE OF TEXAS, acting by and through the Commissioner of the General Land Office, (the "Grantor"), hereby grants to Chocolate Bayou Water Company, a Delaware corporation, whose address is P O Box 550, Alvin, TX 77512-0550, phone number (281) 393-1596, (the "Grantee"), a non-exclusive easement for the purposes identified in Article V.

### ARTICLE II. PREMISES

2.01. The easement is located across a portion of a state-owned riverbed and/or the bed of a navigable stream in the public domain in Fort Bend County, Texas, described as follows:

Brazos River and the easement is approximately .38 Acres (the "Premises").

The Premises are further described or depicted on the Vicinity Map attached hereto as Exhibit A and the Survey Plat attached hereto as Exhibit B, collectively incorporated by reference for descriptive purposes.

2.02. Grantee acknowledges and agrees that when the Improvements (as hereinafter defined) are placed on the Premises, the location of such Improvements within the easement shall thereby become fixed at such location and shall not be changed except by an amendment to this Agreement signed by both parties hereto and subject to any approval by any other governmental agency with jurisdiction over same.

2.03. GRANTEE HAS INSPECTED THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES AND ACCEPTS THE SAME "AS IS", IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. THE GRANTOR DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER WARRANTY WHATSOEVER NOT EXPRESSLY SET FORTH IN THIS AGREEMENT. THE GRANTOR AND GRANTEE HEREBY AGREE AND ACKNOWLEDGE THAT THE USE OF THE TERM "GRANT" IN NO WAY IMPLIES THAT THIS EASEMENT IS FREE OF LIENS, ENCUMBRANCES AND/OR PRIOR RIGHTS. NOTICE IS HEREBY GIVEN TO



GRANTEE THAT ANY PRIOR GRANT AND/OR ENCUMBRANCE MAY BE OF RECORD, AND GRANTEE TAKES SUBJECT TO ANY SUCH PRIOR GRANT AND/OR ENCUMBRANCE. GRANTEE IS ADVISED TO EXAMINE THE RECORDS IN THE ARCHIVES AND RECORDS DIVISION OF THE GENERAL LAND OFFICE, 1700 NORTH CONGRESS AVENUE, AUSTIN, TEXAS 78701-1495, AND ALL OTHER LAND TITLE RECORDS OF THE COUNTY OR COUNTIES IN WHICH THE PREMISES ARE LOCATED. THE PROVISIONS OF THIS SECTION SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS EASEMENT.

### ARTICLE III. TERM

3.01. This Agreement is for a period of ten (10) years, beginning on October 1, 2006, and ending on September 30, 2016, unless renewed, amended, or sooner terminated as authorized by law or as set forth herein.

3.02. Provided that Grantee has complied with all provisions of this Agreement, Grantee shall have the right to extend and renew this Agreement pursuant to 31 TAC §13.17(c) and (d) for an additional term of 10 years on the same terms and conditions provided hereunder, by taking the following actions:

- (i) providing written notice to the Grantor of Grantee's intent to renew the Agreement not less than ninety (90) days prior to expiration of the term of this Agreement; and
- (ii) completing and submit to the Grantor for approval, an application for renewal within thirty (30) days following the notice provided in Section 3.02(i); and
- (iii) paying the applicable renewal fee, pursuant to the rate schedule in effect at the time of renewal; and
- (iv) providing documentation showing the current location of the Improvements. This documentation shall include spatial coordinates sufficient for determining that the pipeline(s) lie within the approved Premises. Such information may be in the form provided to the U.S. Department of Transportation, provided that such documentation includes the current location and spatial coordinates. Notwithstanding the foregoing, and provided that the pipeline has been in place for at least twenty (20) years (an "older pipeline"), Grantee may, in lieu of providing such actual dimensions and spatial coordinates, satisfy the requirements of this subsection (iv) by providing a certified written statement by a Professional Engineer which states that the engineer, despite having employed best efforts to do so, can not ascertain the burial depth and/or location coordinates of such existing pipeline from Grantee's existing records and documentation. Any such certified statement shall also include any documentation in Grantee's possession relating to either the actual dimensions or spatial coordinates of the Improvements. If Grantee, at any time, later discovers or determines the actual burial depth and/or location coordinates of an older pipeline, Grantee agrees to submit such documentation to Grantor. If either Grantor or Grantee determine that an older pipeline is not actually located within the right of way described in this Agreement, both Grantor and Grantee will enter into an amendment to this Agreement to correct the right of way description provided such right of way is located on State-owned land. In any event, Grantee **will indemnify** Grantor pursuant to Section 8.01 of this Agreement even if some or all of the Improvements are not located on State-owned land.

3.03. In the event that Grantee shall fail to comply with the requirements of Section 3.02, Grantee shall be in default hereunder; however, the Easement shall not terminate until Grantor provides notice of such failure and allows a period of thirty (30) days for Grantee to cure such failure and default. Grantee's failure to comply with Section 3.02, even if subsequently cured to Grantor's satisfaction, shall be deemed a forfeiture of any right Grantee may have to renew the Agreement at a reduced fee. Grantor may require (i) the full then-current fee as calculated for a new easement, or, (ii) the applicable renewal fee pursuant to the rate schedule in effect at the time of renewal, plus an administrative penalty as determined by Grantor.

#### ARTICLE IV. CONSIDERATION AND TAXES

4.01. A. As consideration (Consideration) for the granting, or if applicable, renewal of this easement, Grantee agrees to pay the Grantor (payable to the Commissioner of the General Land Office at Austin, Texas) the sum of Three Thousand And 00/100 Dollars (\$3,000.00), due and payable upon the execution of this Agreement.

B. Past due Consideration and other past due payments shall bear interest from maturity at the rate of ten percent (10%) per annum from the date when due until actually paid, as provided in Section 51.301 in TEX. NAT. RES. CODE ANN. (Vernon 2001). Failure of Grantee to make a payment on or before the date the same becomes due shall be deemed an act of default and, at the Grantor's option, cause all payments to become due and payable immediately; provided, however, Grantor shall give Grantee notice of such default and allow a period of thirty (30) days within which to cure the default before exercising such option to accelerate such payments.

4.02. In addition to the above, Grantee shall pay and discharge any and all taxes, general and special assessments, and other charges which during the term of this Agreement may be levied on or assessed against Grantee's interest in the Premises or on the Improvements constructed thereon.

4.03. Grantee agrees to and shall protect and hold the Grantor harmless from liability for any and all such taxes, charges, and assessments, together with any penalties and interest thereon, and from any sale or other proceeding to enforce payment thereof.

#### ARTICLE V. USE OF THE PREMISES

5.01. Grantee and Grantee's employees, contractors, and agents shall have the right to use the Premises for a right-of-way to construct, maintain, operate, inspect, repair, change the size of, relocate, and replace six (6) raw water intake pipelines and two (2) pump stations for the purpose of irrigation (the "Improvements"). Grantee shall not change (i) the operation of the pipeline in any material respect or (ii) the category of products therein, without Grantor's written permission, such permission not to be unreasonably withheld. It shall not be unreasonable for Grantor to withhold its consent for reasons that include, but are not limited to, Grantee's request for: a change in the category of products to be transported that is more "sour" (with reference to hydrogen sulfide content), or that is more volatile, than the original product category to be transported as contemplated by the Agreement; or, a change to a category of products that includes any non-hydrocarbon substances. Also, it shall not be unreasonable for Grantor to (a) condition its consent on Grantee procuring and providing proof to Grantor of adequate insurance to protect the Premises and (b) charge fees for (i) additional pipelines, and (ii) changes in use operation, including but not limited to, a use separate and apart from the original use contemplated by the Agreement, e.g. fiber optics and reverse flow. Grantor agrees to grant or deny such permission within thirty (30) days following Grantee's request for a category use change, provided such request includes all information necessary for Grantor to make an informed decision.

5.02. A. The Grantor and Grantee hereby acknowledge and agree that each shall have reciprocal rights of ingress and egress to and from the Premises across contiguous or adjacent Permanent School Fund land or land owned by Grantee, provided in the exercise of this right the Grantor and Grantee agree not to unreasonably interfere with the other party's (or that party's agents, assignees, or designees) use of its property. At its sole cost, risk, and expense, Grantee shall have the right of ingress and egress for the purposes authorized by Section 5.01 and such right is not granted for any other purpose. Grantee and the Grantor mutually agree to coordinate the use of contiguous or adjacent Permanent School Fund land or land owned by Grantee, respectively, and to exercise such right of use only to the extent and in the manner allowed by the respective interests of the parties in the subjects lands and for the length of time necessary to provide access to and from the Premises. Notwithstanding any other provisions to the contrary, no easement is created by this Section 5.02; instead, a license is granted to the parties and their respective officers, employees, agents and contractors for the limited purposes set forth herein.

B. Grantee acknowledges and agrees that the Grantor's right of ingress and egress described in Section 5.02.A. of this Agreement shall be and remain in effect as long as the Improvements and any other structure placed on



the Premises by Grantee remain on the Premises, as necessary for the Grantor to confirm the removal (in whole or in part) of the Improvements, and/or until any claims of liability against Grantor arising in connection with the Improvements are finally resolved. Such right of ingress and egress shall survive the expiration or earlier termination of this Agreement, but only for so long as the Improvements remain on the Premises and/or any claims for liability have not been finally resolved.

5.03. A. Grantee's use of the Premises is subject to and contingent upon compliance with the following covenants, obligations and conditions (the "Special Conditions"):

1. Grantee is responsible for maintaining all structures authorized under this contract in good repair and safe condition, and in compliance with all existing state and federal regulations governing such work.

B. Prior to any construction, installation, repair, or other activities on the Premises, Grantee shall provide written notice of all the terms of this Agreement relating to the particular activity to any contractor and/or agent involved in any such activity. On request, Grantee shall send a copy of such notice to the General Land Office, ATTN: Asset Inspection, 1700 N. Congress Avenue, Austin, Texas 78701-1495.

5.04. Grantor shall have the right to use or to permit the use of any or all of the Premises for any purpose deemed, in Grantor's sole discretion, not to be inconsistent with Grantee's easement grant. Grantor, its agents, representatives and employees shall have the right to enter upon the Premises at any reasonable time (or any time in case of emergency) for purposes of inspection, repair, and any other purpose necessary to protect Grantor's interests therein. Except in the event of an emergency, in which case no notice is required by Grantor, if Grantor reasonably believes that a repair is necessary to protect the health and safety of the public, the environment, or the value of Grantor's property, Grantor shall give Grantee reasonable prior written notice of the necessary repair. If Grantor gives such notice, and Grantee does not initiate immediate action to pursue to completion such repair with diligence, Grantor may, but shall not be obligated to, undertake that repair, all costs of which shall be immediately due and payable by Grantee on Grantor's demand. This Section 5.04 is for the sole purpose of providing a mechanism for Grantor to respond to a situation in which immediate action is required to protect the State and/or public interest and such immediate action has not been initiated by or on behalf of Grantee.

5.05. Grantee shall not use, or permit the use of the Premises for any illegal purpose. Grantee shall comply, and will cause its officers, employees, agents, contractors and invitees to comply, with all applicable laws, ordinances, rules, and regulations of governing agencies concerning use of the Premises.

5.06. Failure by Grantee to construct, maintain and operate the Improvements in accordance with this Article V may render such Improvements "unauthorized structures" as defined under in TEX. NAT. RES. CODE ANN. §51.302 (Vernon 2001 & Supp. 2003) and subject them to sanctions provided therein.

#### ARTICLE VI. ASSIGNMENTS

6.01. A. Grantee shall not assign the premises or the rights granted herein, in whole or part, to any third party for any purpose without prior written consent of the Grantor, which consent may not be unreasonably withheld. For purposes of this Section 6.01 A, the phrase "third party" shall not include any subsidiary or affiliate in which Grantee owns, respectively, at least a majority percentage, or the largest plurality percentage, voting interest.

B. Grantee may assign this Agreement without Grantor's consent to (a) a parent entity, (b) any affiliate of Grantee controlled by the same parent entity, or (c) any subsidiary or affiliate in which Grantee owns, respectively, at least a majority percentage, or the largest plurality percentage, voting interest, provided that, in any of the foregoing events, (i) the resulting entity agrees in writing to assume and perform all of the terms and conditions of this Agreement, and (ii) Grantee provides notice to Grantor of any such assignment within thirty (30) days of such assignment. In the event of such assignment, it is understood and agreed by both Grantee and Grantor that the



original Grantee remains liable to Grantor under all terms and provisions of the Agreement.

C. Any assignment which fails to comply with the foregoing provisions shall be void and of no effect.

D. This provision and the prohibition against unauthorized assignments contained herein shall survive expiration or earlier termination of this Agreement. For purposes of this Agreement, an assignment is any transfer, including by operation of law, to another of all or part of the property, interest or rights herein granted.

#### ARTICLE VII. PROTECTION OF NATURAL AND HISTORICAL RESOURCES

7.01. With regard to all activities authorized herein, Grantee shall use all reasonable best efforts to: (i) prevent pollution of air, ground, and water in and around the Premises, and (ii) to protect and preserve natural resources and wildlife habitat. Grantee shall comply with all applicable rules and regulations of the General Land Office, the School Land Board, and other governmental agencies responsible for the protection and preservation of public lands and waters, natural resources, and wildlife habitat. In the event of a pipeline incident that is reportable to the U.S. Department of Transportation, the General Land Office, or the Railroad Commission of Texas (or any other applicable regulatory agency) that may result in pollution of the Premises or adjacent property, Grantee shall notify the Grantor immediately upon discovery of such incident, use all means reasonably available to recapture any pollutants which have escaped or may escape, and mitigate for any and all natural resource damages caused thereby.

7.02. GRANTEE IS HEREBY EXPRESSLY NOTIFIED OF THE NATIONAL HISTORICAL PRESERVATION ACT OF 1966, (PB-89-66, 80 STAT. 915, 16 U.S.C.A. SECTION 470, ET. SEQ.) AND THE ANTIQUITIES CODE, [TITLE 9, CHAPTER 191, TEX. NAT. RES. CODE ANN. (VERNON 2001 & SUPP. 2003)]. IN CONFORMANCE WITH THESE LAWS, IN THE EVENT THAT ANY SITE, FOUNDATION, BUILDING, STRUCTURE, LOCATION, OBJECT, ARTIFACT, ITEM OR OTHER FEATURE OF ARCHEOLOGICAL, SCIENTIFIC, EDUCATIONAL, CULTURAL OR HISTORIC INTEREST IS ENCOUNTERED DURING THE ACTIVITIES AUTHORIZED BY THIS EASEMENT, GRANTEE SHALL IMMEDIATELY CEASE ANY AND ALL ACTIVITIES, AND NOTIFY THE COMMISSIONER OF THE GENERAL LAND OFFICE AND THE TEXAS HISTORICAL COMMISSION, PO BOX 12276, AUSTIN, TEXAS 78711, SO THAT APPROPRIATE ACTION MAY BE UNDERTAKEN TO PROTECT OR RECOVER SUCH DISCOVERIES OR FINDINGS, AS APPROPRIATE. IN THE EVENT THAT GRANTEE IS REQUIRED TO CEASE ACTIVITIES, THE GRANTOR SHALL NOT BE LIABLE FOR ANY COSTS OF GRANTEE, GRANTEE'S AGENTS, EMPLOYEES, CONTRACTORS, SUBCONTRACTORS OR ANY OTHER PERSON OR ENTITY AS A RESULT OF ANY INTERRUPTION OF GRANTEE'S ACTIVITIES OR INABILITY TO USE THE PREMISES AS HEREIN CONTEMPLATED.

#### ARTICLE VIII. INDEMNITY

8.01. GRANTEE SHALL BE FULLY LIABLE AND RESPONSIBLE FOR ANY DAMAGE, OF ANY NATURE, ARISING OR RESULTING FROM OR ATTRIBUTABLE TO GRANTEE'S USE GRANTED HEREIN OR THE ACTS OR OMISSIONS OF GRANTEE, ITS AGENTS OR CONTRACTORS RELATED TO GRANTEE'S EXERCISE OF THE RIGHTS GRANTED HEREIN. GRANTEE AGREES TO AND SHALL INDEMNIFY AND HOLD THE GRANTOR, THE GRANTOR'S OFFICERS, AGENTS, AND EMPLOYEES, HARMLESS FROM AND AGAINST CLAIMS, SUIT, COSTS, LIABILITY OR DAMAGES OF ANY KIND, INCLUDING STRICT LIABILITY CLAIMS, COSTS OF COURT, ATTORNEY'S FEES AND COSTS OF INVESTIGATION OR EXPERTS, WITHOUT LIMIT AND WITHOUT REGARD TO CAUSE OF THE DAMAGE OR THE NEGLIGENCE OF ANY PARTY, (EXCEPT TO THE EXTENT OF THE PROPORTIONATE NEGLIGENCE OR WILLFUL MISCONDUCT OF THE GRANTOR, THE GRANTOR'S OFFICERS, AGENTS, EMPLOYEES, OR CONTRACTORS) ARISING DIRECTLY OR INDIRECTLY FROM OR ATTRIBUTABLE TO GRANTEE'S USE OF THE PREMISES (INCLUDING ANY ADJACENT OR CONTIGUOUS LAND) OR FROM ANY BREACH BY GRANTEE OF THE TERMS, COVENANTS OR CONDITIONS CONTAINED HEREIN. THE PROVISIONS OF THIS SECTION SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS AGREEMENT.



## ARTICLE IX. DEFAULT, TERMINATION AND EXPIRATION

9.01 If, within thirty (30) days after receipt of written notice from the Grantor specifying an act of default or breach, Grantee fails to pay any money due hereunder or continues in breach of any term or condition of this Agreement, the Grantor shall have the right to terminate this Agreement and all rights inuring to Grantee herein. Should Grantee fail to cure the specified default or breach within the allowed thirty (30) day period, this Agreement shall be subject to termination, and upon such termination all rights granted herein to Grantee shall revert to the Grantor. Such termination shall not prejudice the rights of the Grantor to collect any money due or to seek recovery on any claim arising hereunder.

9.02. Except as otherwise provided by applicable law or rule and subject to obtaining necessary approval from state or federal agencies having applicable jurisdiction, or making best efforts to obtain such permits, Grantee shall, within one hundred twenty (120) days from the date of expiration or sooner termination of this Agreement, initiate removal of all personal property, structures, and the Improvements, and shall restore the Premises (and any other property affected by such removal activities) to the same condition that existed before Grantee entered thereon. Such removal and restoration activities shall be coordinated with the General Land Office in accordance with guidelines in effect at the time of removal/restoration which may include, without limitation, specific removal techniques required for protection of natural resources and mitigation or payment in lieu of mitigation for any and all damages resulting from removal activities, all of which shall be in accordance with generally accepted current pipeline industry standards using available technology. Grantee shall notify the Grantor at least ten (10) days before commencing removal/restoration activities so that a General Land Office field inspector may be present.

## ARTICLE X. NOTICE

10.01. Any notice which may or shall be given under the terms of this Agreement shall be in writing and shall be either delivered by hand, by facsimile, or sent by United States first class mail, adequate postage prepaid, if for the Grantor to Deputy Commissioner, Professional Services, addressed to his attention, 1700 North Congress Avenue, Austin, Texas 78701-1495, FAX: (512) 463-5304, and if for Grantee, to it at P O Box 550, Alvin, TX 77512-0550, and FAX: (281) 581-9921. Any party's address may be changed from time to time by such party by giving notice as provided above, except that the Premises may not be used by Grantee as the sole notice address. No change of address of either party shall be binding on the other party until notice of such change of address is given as herein provided.

10.02. For purposes of the calculation of various time periods referred to in this Agreement, notice delivered by hand shall be deemed received when delivered to the place for giving notice to a party referred to above. Notice mailed in the manner provided above shall be deemed completed upon the earlier to occur of (i) actual receipt as indicated on the signed return receipt, or (ii) three (3) days after posting as herein provided.

## ARTICLE XI. INFORMATIONAL REQUIREMENTS

11.01. A. For newly constructed pipelines, Grantee shall submit to the Grantor, within one hundred eighty (180) days following installation or construction of the Improvements authorized in this Agreement, an "as-built" survey and field notes prepared by a surveyor duly licensed by the State of Texas. The as-built survey shall be conducted in accordance with the Grantor's survey requirements attached hereto as Exhibit C. Failure or refusal by Grantee to timely provide the as-built survey when due hereunder and the continuance of such failure for thirty (30) consecutive days after the receipt of the Grantor's written notice to Grantee specifying such failure may be treated as a default by Grantee hereunder and the Grantor may, in addition to any other remedy and in the Grantor's sole discretion, terminate this Agreement and require removal of any personal property and the Improvements located on the Premises in accordance with Section 9.02 of this Agreement.

B. Upon receipt of the as-built survey, prepared in accordance with this Section 11.01, the Grantor shall compare the as-built survey with the proposed location of the Improvements, as represented by Grantee's application



to the Grantor and set forth in Section 2.01 (and referenced Exhibits) hereof. If there are changes or discrepancies in the location of the Improvements authorized by this Agreement, the Grantor may either terminate this Agreement, or: (i) upon determination that the changed location results in unacceptable adverse impacts, require relocation of the Improvements to conform to the authorized right of way, or (ii) upon determination of no unacceptable adverse impacts, agree to replace Exhibit B attached hereto with a substitute exhibit denoted as Exhibit B-1. The substitute exhibit shall be consistent with the as-built survey and signed by both parties. Upon attachment of Exhibit B-1 hereto, Exhibit B shall be void and of no further effect.

C. If all or any part of the Improvements are buried, Grantee shall submit to the Grantor, within one hundred eighty (180) days following installation or construction of the Improvements, a survey which includes coordinates, or at Grantor's option, "depth of cover" data, prepared by a surveyor duly licensed by the State of Texas. The survey shall be conducted in accordance with the Grantor's survey requirements attached hereto as Exhibit C. Failure or refusal by Grantee to timely provide the survey when due hereunder and the continuance of such failure for thirty (30) consecutive days after the receipt of the Grantor's written notice to Grantee specifying such failure may be treated as a default by Grantee hereunder and the Grantor may, in addition to any other remedy and in the Grantor's sole discretion, terminate this Agreement and require removal of any personal property and the Improvements located on the Premises in accordance with Section 9.02 of this Agreement.

11.02. A. Grantee shall provide written notice to the Grantor of any change in Grantee's name, address, or legal status (from a corporate entity to a partnership, etc.) and any change to other information required by this Agreement within thirty (30) days of the effective date of the change.

B. Grantee shall provide to the Grantor any other information reasonably requested by the Grantor in writing within thirty (30) days following such request.

C. If any information required to be submitted within a certain time under the terms of this Agreement shall not be received by the Grantor on or before ten (10) days after the date when due, after notice to Grantee and opportunity to cure, then, at Grantor's discretion, Grantee may be required to pay the Grantor a "Late Charge" not to exceed One Hundred Dollars (\$100.00) for each day so past due until the date on which the information is received or the Agreement is terminated.

11.03. Except with regard to initial construction/installation of the Improvements and emergencies, prior to conducting any activities at the Premises which may materially impact natural resources in or around the Premises, Grantee shall provide written notice to the Grantor describing the proposed activities in detail and any procedures which will be used to protect natural resources. Such notice shall be provided by Grantee to the Grantor at least sixty (60) days prior to conducting re-burial activities, and at least thirty (30) days prior to conducting major repairs, modification, or other activities. Grantee acknowledges and agrees that the Grantor shall have at least twenty (20) days following receipt of the notice to review the proposed activities and to impose specific conditions for conducting such activities which, in the Grantor's sole determination, are necessary to protect natural resources or to mitigate for actual damages to natural resources. If the Grantor has not provided notice to Grantee within twenty (20) days following receipt of Grantee's notice, the Grantor is deemed to have approved, subject to the terms of this Agreement, the proposed activities to be conducted at the Premises. In case of emergencies, Grantee may undertake all actions necessary to prevent imminent injury or damage to public health, safety or welfare, and/or to protect natural resources, and Grantee shall undertake any such actions as are, in the pipeline industry, ordinary and commercially reasonable responses to such emergencies. Within twenty-four (24) hours following such emergency actions, Grantee shall provide notice to the Grantor of such actions as hereinabove provided.

## ARTICLE XII. MISCELLANEOUS PROVISIONS

12.01. With respect to terminology in this Agreement, each number (singular or plural) shall include all numbers, and each gender (male, female or neuter) shall include all genders. If any provision of this Agreement shall ever be held



to be invalid or unenforceable, such invalidity or unenforceability shall not affect any other provisions of the Agreement, but such other provisions shall continue in full force and effect.

12.02. The titles of the Articles in this Agreement shall have no effect and shall neither limit nor amplify the provisions of the Agreement itself. This Agreement shall be binding upon and shall accrue to the benefit of the Grantor, its successors and assigns, Grantee, Grantee's successors and assigns (or heirs, executors, administrators and assigns, as the case may be); however, this clause does not constitute a consent by the Grantor to any assignment by Grantee, but instead refers only to those instances in which an assignment is hereafter made in strict compliance with Article VI above, or in the case of a deceased natural person grantee, refers to the instances previously referred to in this sentence and also circumstances in which title to Grantee's interest under this Agreement passes, after the demise of Grantee, pursuant to Grantee's will or the laws of intestate succession. The words "hereof," "herein," "hereunder," "hereinafter" and the like refer to this entire instrument, not just to the specific article, section or paragraph in which such words appear.

12.03. Neither tender nor acceptance of any sums payable hereunder nor failure by either party to complain of any action, non-action or default of the other shall constitute a waiver as to any breach of any covenant or condition contained herein nor a waiver of any of the rights hereunder. Waiver by the Grantor of any right for any default of Grantee shall not constitute a waiver of any right for either a prior or subsequent default of the same obligation or for any prior or subsequent default of any other obligation. No right or remedy of either party hereunder or covenant, duty or obligation hereunder shall be deemed waived by the other party unless such waiver be in writing, signed by a duly authorized representative of the party.

12.04. No provision of this Agreement shall be construed in such a way as to constitute the Grantor and Grantee joint venturers or co-partners or to make Grantee the agent of the Grantor or make the Grantor liable for the debts of Grantee.

12.05. In all instances where Grantee is required hereunder to pay any sum or do any act at a particular indicated time or within an indicated period, it is understood that time is of the essence.

12.06. The terms of this Agreement shall only be binding on the Grantor during the period of its ownership of the Premises, and in the event of the transfer of such ownership interest, the Grantor shall thereupon be released and discharged from all covenants and obligations thereafter accruing, but such covenants and obligations shall be binding during the Agreement term upon each new owner for the duration of such owner's ownership.

12.07. All monetary obligations of the Grantor and Grantee (including, without limitation, any monetary obligation for damages for any breach of the respective covenants, duties or obligations of either party hereunder) are performable exclusively in Austin, Travis County, Texas.

12.08. The obligation of Grantee to pay all Consideration and other sums hereunder provided to be paid by Grantee and the obligation of Grantee to perform Grantee's other covenants and duties under this Agreement constitute independent, unconditional obligations to be performed at all times provided for hereunder, save and except only when an abatement thereof or reduction therein is expressly provided for in this Agreement and not otherwise. Grantee waives and relinquishes all rights which Grantee might have to claim any nature of lien against, or withhold or deduct from or offset against, any Consideration or other sums provided hereunder to be paid to the Grantor by Grantee. Grantee waives and relinquishes any right to assert, either as a claim or as a defense, that the Grantor is bound to perform or is liable for the nonperformance of any implied covenant or implied duty of the Grantor not expressly set forth in this Agreement.

12.09. Subject in all respects to Section 12.01 of this Agreement, this Agreement is and shall be subject to any applicable federal or state law, rule, order, or regulation presently or hereafter enacted or adopted to the extent, but only to the extent, that such law, rule, order, or regulation preempts or supersedes Grantor's authority to issue this Agreement or to require any particular obligation of Grantee, provided, however, that in the event of a conflict

between any provision of this Agreement and any administrative rule promulgated by the General Land Office and/or the School Land Board, this Agreement shall control.

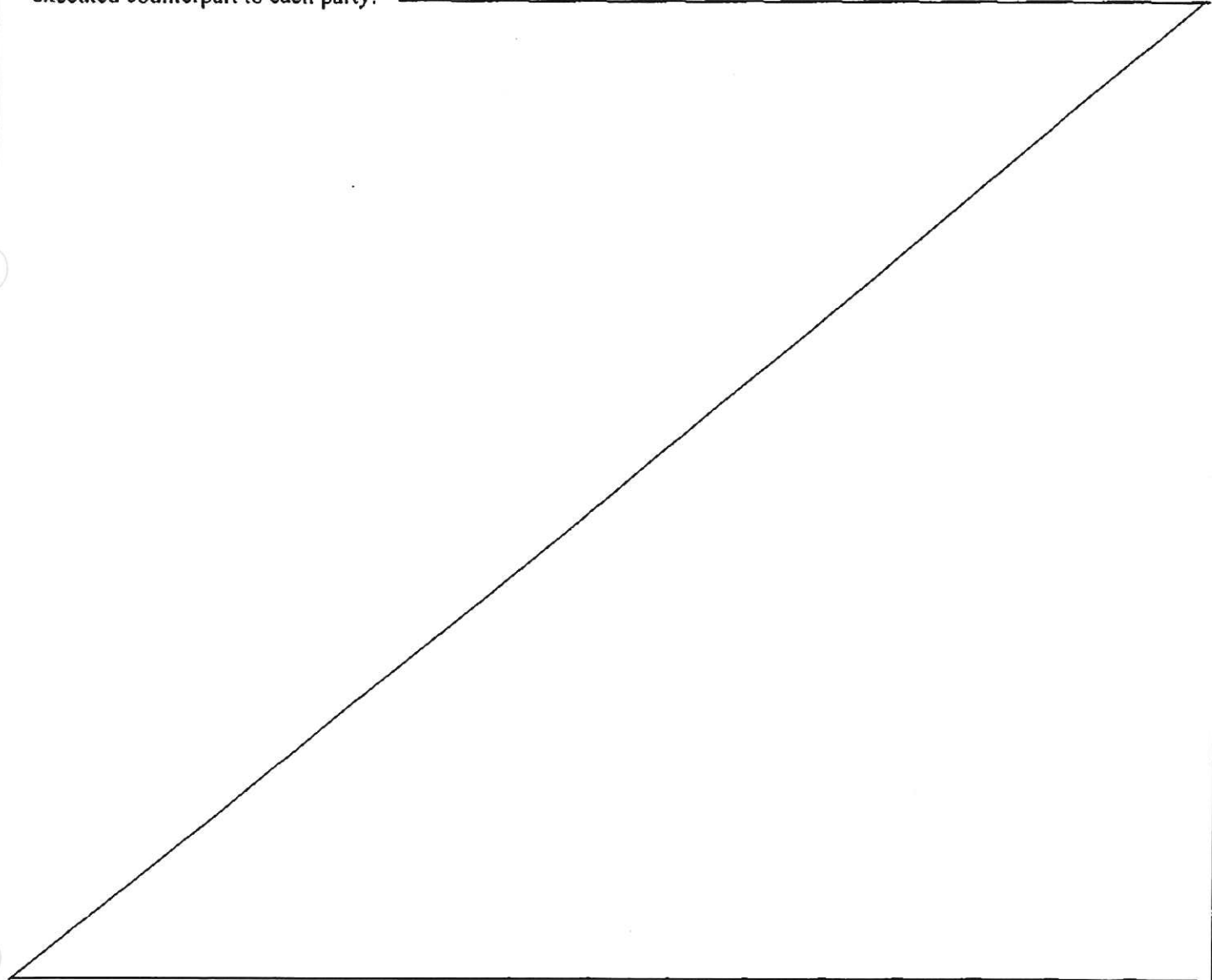
#### ARTICLE XIII. RECORDING

13.01. Grantee shall, at its sole cost and expense, record this Agreement in the Fort Bend County Real Property Records and provide a file marked copy to the Grantor within 60 days after the recorded original of this Agreement is returned by the county clerk responsible for such records.

#### ARTICLE XIV. ENTIRE AGREEMENT

14.01. This instrument, including exhibits, constitutes the entire agreement between the Grantor and Grantee and no prior written, or prior or contemporaneous oral promises, warranties or representations shall be binding. This Agreement shall not be amended, changed, altered, or extended except by written instrument signed by all parties hereto.

14.02. This Agreement shall become effective only upon execution by all parties hereto and delivery of a fully executed counterpart to each party. \_\_\_\_\_





IN TESTIMONY WHEREOF, witness our hands and the seal of the General Land Office.

GRANTOR: THE STATE OF TEXAS

By: Jerry E. Patterson  
JERRY E. PATTERSON  
Commissioner, General Land Office

Date: 12/21/06

GRANTEE: CHOCOLATE BAYOU WATER  
COMPANY

By: Sabrina Finnegan  
(Printed Name)

Title: Vice President

Date: 12/6/06

APPROVED:

Contents: NSP

Legal: ESM

Deputy: BT

Executive: MP

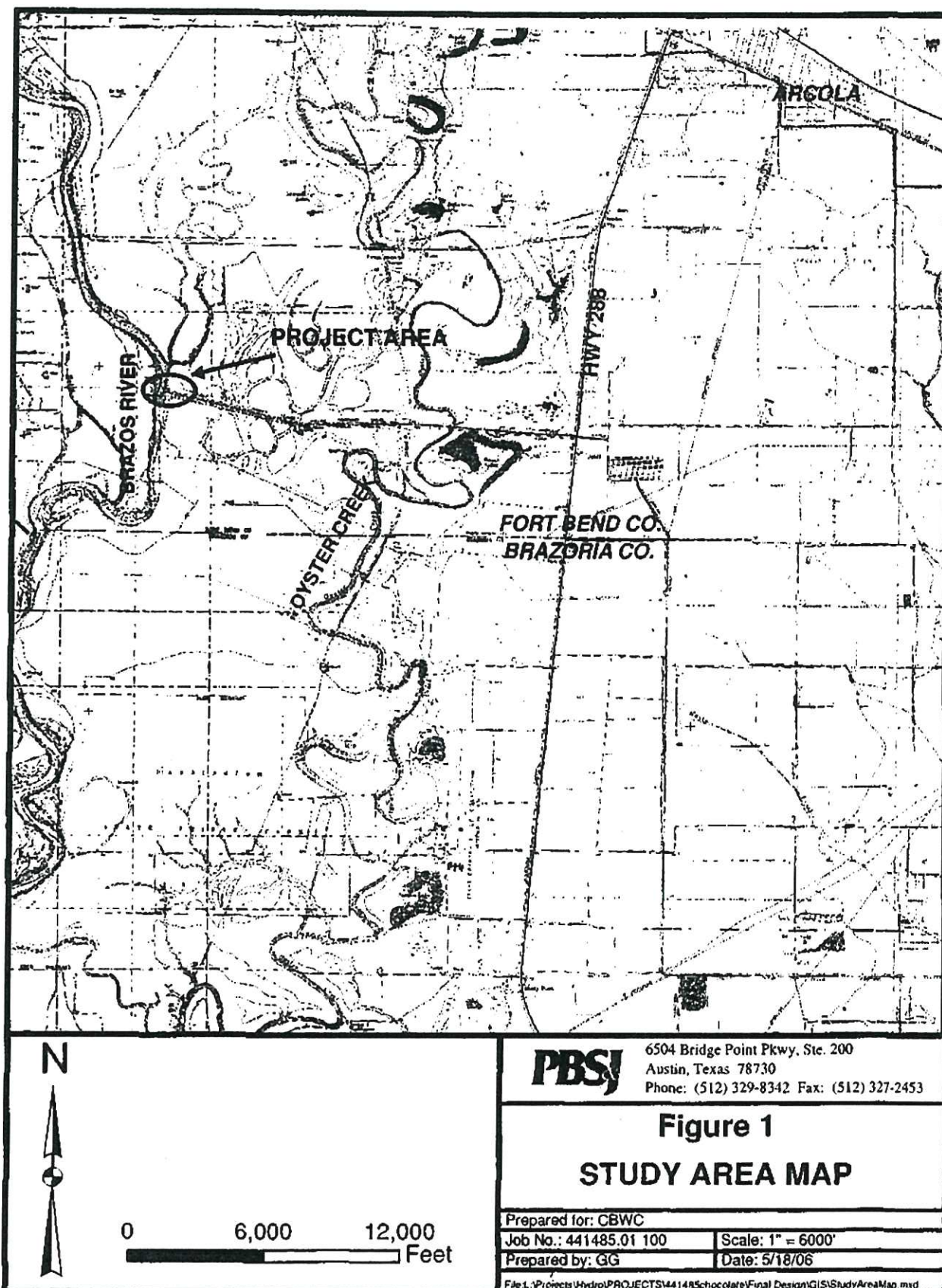
ACKNOWLEDGMENT

STATE OF Georgia §  
COUNTY OF Chatham §

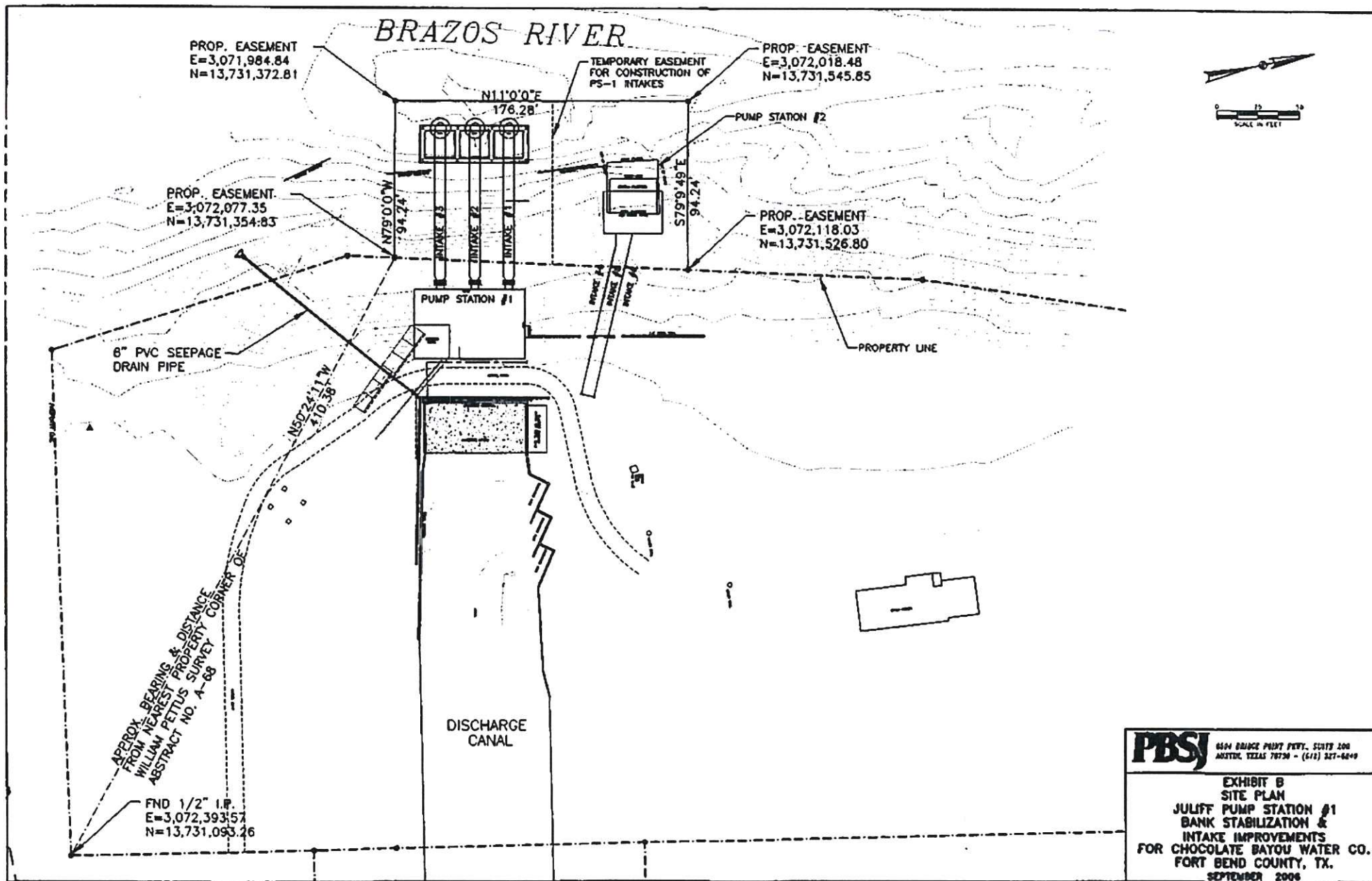
This instrument was acknowledged before me on the 7<sup>th</sup> day of December, 2006,  
by Sabrina Finnegan, Vice President of  
(Title)  
Chocolate Bayou Water Co., a Delaware  
(Company Name) (State)  
corporation, on behalf of the corporation  
(Business entity type) (Business entity type)

Linda C. Howard  
Notary Public, State of Georgia  
My commission expires: \_\_\_\_\_

LINDA G. HOWARD  
Notary Public, Chatham County, GA  
My Commission Expires February 22, 2009







## Instructions for Preparing Exhibits for the following General Land Office Applications:

### Miscellaneous Easements (Pipeline)

Maps (or plats) showing the location of proposed and as-built projects on state-owned lands are required as part of the General Land Office (GLO) application process. The following instructions are to be followed when applying for new work (proposed project), or for reporting as-built conditions for a previously approved project, when the activity is a **Miscellaneous Easement (Pipeline)** on state land.

The information specified below represents minimum requirements of the GLO and additional information may be requested on a project-by-project basis to facilitate a full evaluation of the proposed activity.

The information should be submitted along with the required application form and processing fees. Each map or plat must conform to the specifications contained herein. An application is not considered complete, and processing of the application will not be initiated, until all information requested has been submitted and GLO staff has determined that it is adequate.

NOTE: Surveys and survey plats required by other entities, Federal, State, County and/or City, are PERMISSIBLE and USABLE for GLO applications provided they meet the following requirements.

### IF SUBMITTING SURVEY PLATS DIGITALLY, PLEASE PROVIDE THE INFORMATION IN ONE OF THE FOLLOWING FORMATS:

1. In an ESRI format (i.e. Shape file, E00, or Geodatabase)
2. AutoDesk Map 6 or earlier version in a DWG format.
3. **And Projection Information of the data set submitted.**

#### A. GENERAL INSTRUCTIONS for ALL APPLICATIONS:

1. Each map or plat should be 8-1/2" X 11".
2. A one-inch margin should be left at the top edge of each sheet for binding purposes.
3. Any shading used to identify specific areas must be reproducible by ordinary copy machines.
4. Each map or plat submitted must have a title block identifying, at a minimum: (a) applicant name; (b) applicant address; (c) project name; (d) date of preparation; (e) name of preparer, and (f) project location as follows:
  - (1) if on state-owned uplands, then provide county, survey name (original grantee) and, as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number;
  - (2) if on submerged land, then provide county, waterbody name, and state tract number;
5. The scale for each map or plat must be clearly indicated both digitally and by graphic scale.
6. Vicinity Maps -- Exhibit A for each project application must be a Vicinity Map showing the general location of the proposed work. The Vicinity Map must be produced using either a U.S.G.S. 7.5 minute Topographic Map, a Texas Department of Transportation County Road Map, or navigation chart as its base layer. The project location should be indicated by a prominent arrow on the map. An 8 1/2" X 11" Xerox copy from the original Topo, county map, or navigation chart showing the project location is sufficient. It is not necessary to submit the entire Topo or county map, so long as the map is appropriately identified as to the origin of the base information (e.g., name, and date of base map information used). This is most easily accomplished by copying the legend of the base map and making it part of the Vicinity Map.



7. Project Site Map -- Exhibit B for each project application should be a Project Site Map (in Survey Plat format) which provides specific project location information. The Project Site Map should be produced at sufficient scale and detail to enable field inspectors to locate the project on the ground with minimal difficulty. Demographic features such as road numbers, stream names, railroad crossings, corporate city limits, and other prominent locative features should be included on the Project Site Map. The project location should be indicated by a prominent arrow on the map and a North arrow must be provided. Annotation may be included on the map regarding distance of the project from known points (e.g., highway intersections, road stream crossings, etc.). **Additional guidance for preparing Project Site Maps is provided in Section B of this document.**

8. Detailed Project Plan -- Exhibit C for each project application should be a Detailed Project Plan, consisting of an aerial plan-view drawing and a cross-sectional drawing of all proposed or existing structures on state-owned lands at the project site.

Page 1 of the Detailed Project Plan should contain, at a minimum:

- a. Location of the shoreline or banks if the project is on or adjacent to tidally influenced waters or crosses a state-owned river, stream, creek, or bayou.
- b. The direction of ebb and flow if in or adjacent to tidal waters, or the direction of water flow if the project crosses a river, creek, stream, or bayou.
- c. A North arrow.
- d. The location of state tract lines (on tidally influenced lands), survey lines, or property lines, as applicable.
- e. The location of any marshes, submerged grass flats, oyster reefs, mud or sand flats, or other sensitive natural/cultural resources known to exist in the project area.
- f. The lines of mean high water and mean low water when applicable.
- g. The Detailed Project Plan cross-sectional drawing must include notation as to the outside diameter (OD) of all pipelines covered by the easement, and the relationship of the pipeline(s) to any other pipeline(s) in the immediate vicinity.
- h. The registration, easement, or lease numbers for any structures at the site previously authorized by the GLO (available from GLO field offices upon request).
- i. Any applicable Corps of Engineers application numbers covering the proposed work, as soon as that application number is available, but, in any event, prior to issuance of the easement.

Page 2 of the Detailed Project Plan should contain, as applicable, an explanation of construction methodology, techniques, and equipment that will be used at the site.

9. As-Built Survey -- A survey showing the depth of burial must be furnished for all projects on state-owned tidally influenced lands (Gulf of Mexico, bays, estuaries, etc.), crossings of state-owned rivers/streams/creeks/bayous. The survey shall show plan view only for projects on state-owned upland tracts. Failure to provide this information is, by terms of the state contract, grounds for termination of the easement and removal of the structure from state-owned land.

**New Pipeline Installations:** Each application for installation of a new pipeline must include with the application a profile drawing showing the proposed depth of burial at not fewer than 36" below the surface.

GLO will issue an easement using the proposed ROW and depth of burial information. Following installation of the pipeline, however, the applicant is required by terms of the GLO contract to provide a survey of actual burial depth measurements for that portion of the ROW length occupying state-owned land. The spacing between depth-of-burial measurement points is a function of the length of ROW. If the easement length is less than 500 feet, the depth of cover of the structure and waterway bottom elevation shall be determined at intervals not to exceed 50 feet. If the easement length is greater than 500 feet but less than 5,000 feet the interval between measurement points shall be 100 feet. Easements greater than 5,000 feet in length shall be surveyed at 250-foot intervals.

All work shall be performed under the supervision of and sealed by a registered public land surveyor. All submitted drawings must be sealed by the supervising registered public land surveyor. All elevations must be referenced to a common datum (Mean Sea Level, National Geodetic Vertical Datum, Mean Low Water, etc.) and grid coordinates must reference Texas State Plane coordinate System of 1927 or 1983. The accuracy of the waterway bottom and pipeline elevations shall be +/- one-half (.5') foot for the waterway bottom and +/- one-half (0.5') foot for depth of burial less than or equal to 10 feet and +/- fifteen (15%) percent for depth of burial greater than ten (10) feet. Manual probing and electronic means (both active and passive) of survey type shall be acceptable for depth of burial determinations.



**Existing Pipelines:** At time of renewal of a contract for an existing underground pipeline easement, provide the data as required under Section 3.02.(iv) of this easement contract.

**CERTIFICATION BY A TEXAS REGISTERED PUBLIC LAND SURVEYOR IS REQUIRED ON ALL OF THE FOLLOWING WITH THE EXCEPTION OF DIRECTIONALLY DRILLED WELL BORE LOGS.**

**B. SPECIFIC INSTRUCTIONS:**

Maps or Survey Plats to be submitted as the Project Site Map and/or the Detailed Project Plan (see A7 and 8 above) must contain the information described below.

Upland survey data should be reported to normal boundary land surveying minimum standards. Offshore or submerged sites shall be located to a specified accuracy of  $\pm 5$  feet of any reported location.

**1. Projects located on Tidally Influenced State-owned lands** (Including the Gulf of Mexico, bay tracts, and the tidally influenced portions of rivers, creeks, streams, and bayous):

Coordinates must be provided at the beginning and ending points of the ROW's centerline, or on the principal point or points of tracts described by other means (directional well bores, etc.). These coordinates must be based on the Texas State Plane Coordinate System of 1927 or 1983. Courses and distances must be specified as either grid or geodetic for all centerlines and perimeter lines, and ties must be made from specific improvements (e.g., well heads, platforms, pilings, etc.) to a corner or corners of the lease or easement tract. All submerged state land tracts crossed by any part of the ROW must be shown and identified, and the points of each ROW crossing of a state-tract boundary identified in the Texas State Plane Coordinate System of 1927 or 1983. The distance between crossings of a state-tract boundary must be indicated in both feet and rods on the plat.

As-built plats (and confirmation surveys at time of renewal) must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the ROW, the plat shall provide a minimum of one identified point for each 1,000 feet of ROW length. A ROW less than 1,000 feet long but greater than 500 feet in length requires one mid-point to be identified on the survey plat.

**2. Projects Across State-owned Upland Property, or the state-owned portion of a river, creek, stream, or bayou above the limit of tidal influence:**

**a. Upland Tract (State Fee Lands):**

For new project applications, information provided for projects on state-owned upland tracts shall include the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the proposed easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with the survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the easement.

At completion of construction, or at time of renewal, an as-built plat or confirmation survey (which ever is applicable) must be submitted. This plat must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the easement route, the plat shall provide a minimum of one identified point for each 1,000 feet of length. For easement routes fewer than 1,000 feet long but greater than 500 feet, one mid-point shall be identified on the survey plat.

**b. Crossing the State-owned portion of a river, creek, stream, or bayou above the limit of tidal influence**

Information provided for projects crossing non-tidal state-owned rivers, creeks, streams, or bayous shall include an identification of the stream or water body by local and any other names known (historic, from topographic or other maps, etc.). In addition, the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with a cross section or profile of the crossing between the top of the high banks, survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the easement.



## **Attachment 6**

Addendum to Technical Information Report:  
Canal Documentation

Bryan W. Shaw, Ph.D., *Chairman*  
Carlos Rubinstein, *Commissioner*  
Toby Baker, *Commissioner*  
Zak Covar, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

September 14, 2012

Ms. Molly Cagle, Partner  
Baker Botts L.L.P.  
98 San Jacinto Boulevard, Suite 1500  
Austin, Texas 78701

Re: Gulf Coast Water Authority; Certificate of Adjudication No. 12-5168

Dear Ms. <sup>Molly</sup>~~Cagle~~:

We have reviewed the request from Gulf Coast Water Authority (GCWA) concerning Certificate of Adjudication No. 12-5168, which was issued after the adjudication of Permit No. 1040, and the right to use the bed and banks of Jones and Oyster Creeks. As stated in the Adjudication Engineer's Report, Permit No. 1040, issued in 1927, authorized the use of the "channel and banks" of Jones and Oyster Creeks for the conveyance of water.

The Final Determination in the Brazos River Basin and Brazos-San Jacinto Coastal Basin (Final Determination) dated June 26, 1985, includes section 5(c), which states, in part, that all of the terms and conditions stated in permits or amended certified filings shall continue in full force and effect, except for obsolete, irrelevant or immaterial terms and conditions. The Final Judgment and Decree of the 26<sup>th</sup> Judicial District of Williamson County (Final Decree) entered November 24, 1986, affirmed the Final Determination. Therefore, I confirm that, based on the Final Determination and the Final Decree, GCWA is authorized to use the bed and banks of Jones and Oyster Creeks.

If you have any questions, please don't hesitate to call me at 512/239-0665.

Sincerely,

A handwritten signature in black ink, appearing to read "Caroline M. Sweeney".

Caroline M. Sweeney  
Deputy Director  
Office of Legal Services

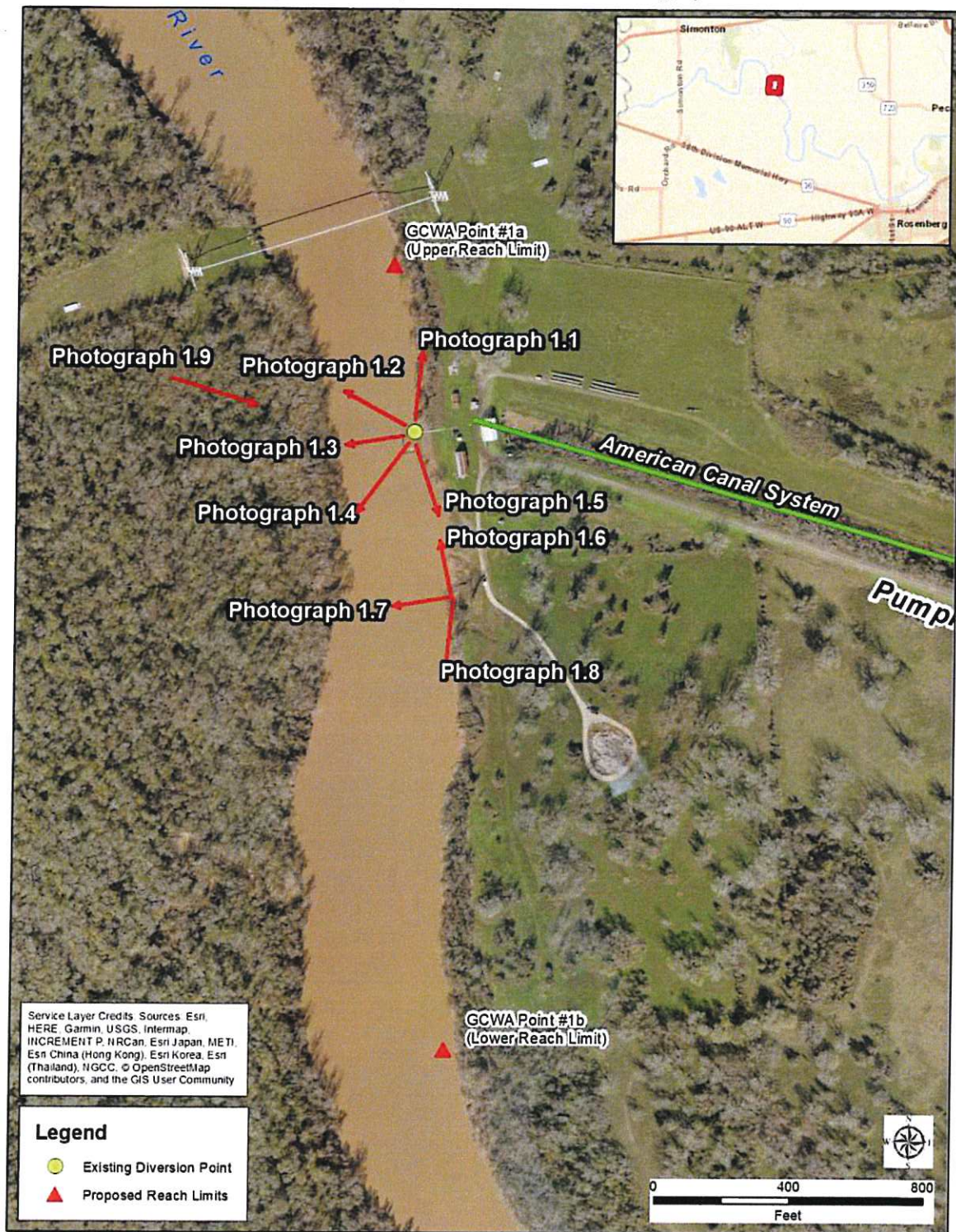
## **Attachment 7**

Addendum to Worksheet 5.0:  
Diversion Point Photographs and Supporting Information



## Section 1– Photographs of the River at Diversion Point 1\*

Figure 1-1. Map of Diversion Point Photographs



\*This diversion point is currently authorized by Certificates of Adjudication (CA) 12-5168 and 12-5171, as previously amended. The application seeks to authorize this diversion point for CA 12-5322. Photographs were taken at the nearest accessible location to project features.



**Photograph 1.1. Intake Point, Looking Upstream**



**Photograph 1.2. Intake Point, Looking Upstream Across River**





**Photograph 1.3. Intake Point, Looking Across River**



**Photograph 1.4. Intake Point, Looking Downstream Across River**





**Photograph 1.5. Intake Point, Looking Downstream**



**Photograph 1.6. South of Intake Point, Looking Upstream**





**Photograph 1.7. South of Intake Point, Looking Across River**



**Photograph 1.8. South of Intake Point, Looking Downstream**



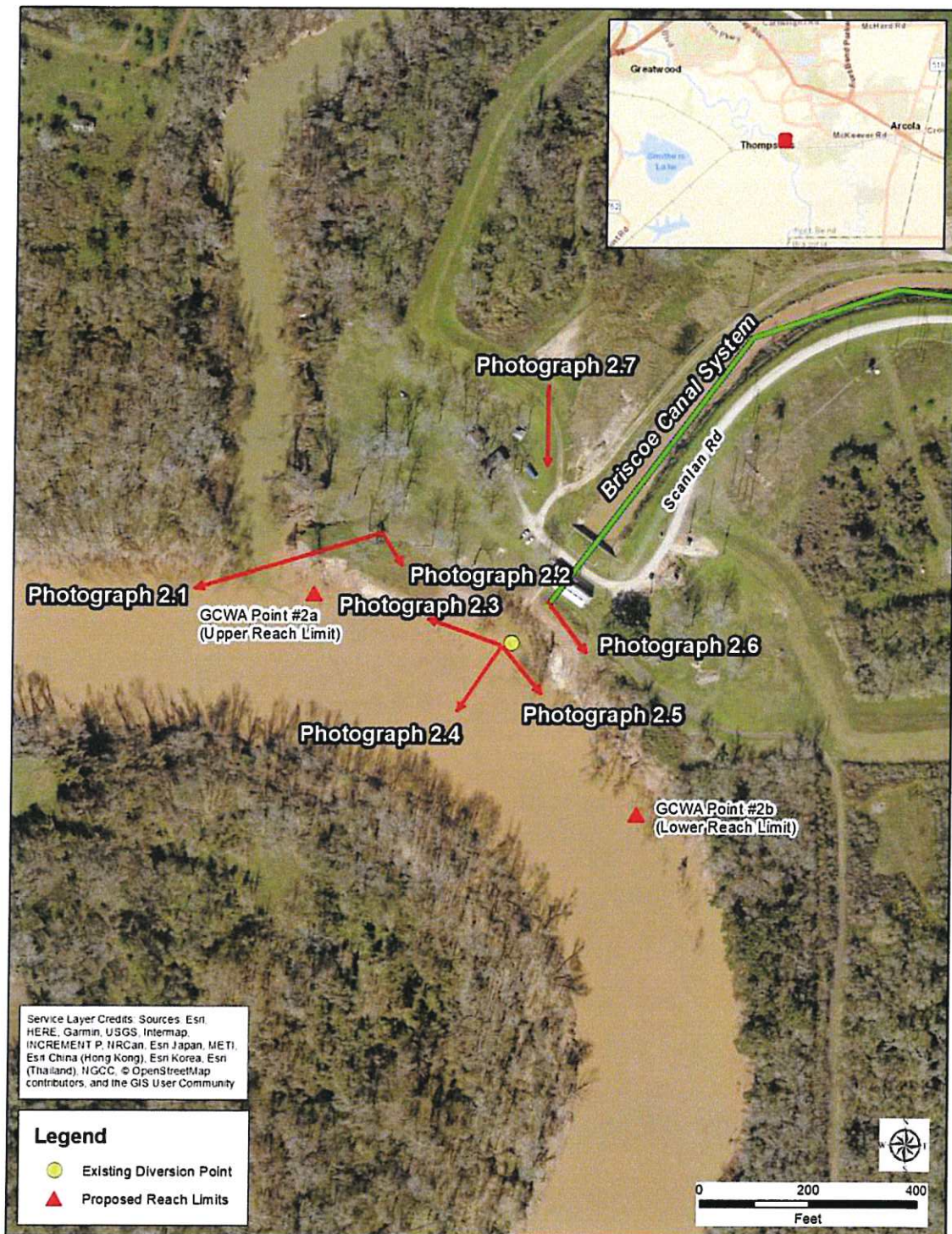
**Photograph 1.9. West Side of River, Looking Southeast**





## Section 2 – Photographs of the River at Diversion Point 2\*

Figure 2-1. Map of Diversion Point Photographs



\*This diversion point is currently authorized by Certificates of Adjudication (CA) 12-5168, 12-5171, and 12-5322, as previously amended. Photographs were taken at the nearest accessible location to project features.



**Photograph 2.1. North of Intake Point, Looking Upstream**



**Photograph 2.2. North of Intake Point, Looking Downstream**





**Photograph 2.3. Intake Point, Looking Upstream**



**Photograph 2.4. Intake Point, Looking Across River**





**Photograph 2.5. Intake Point, Looking Downstream**



**Photograph 2.6. Upslope from Intake Point, Looking Downstream**



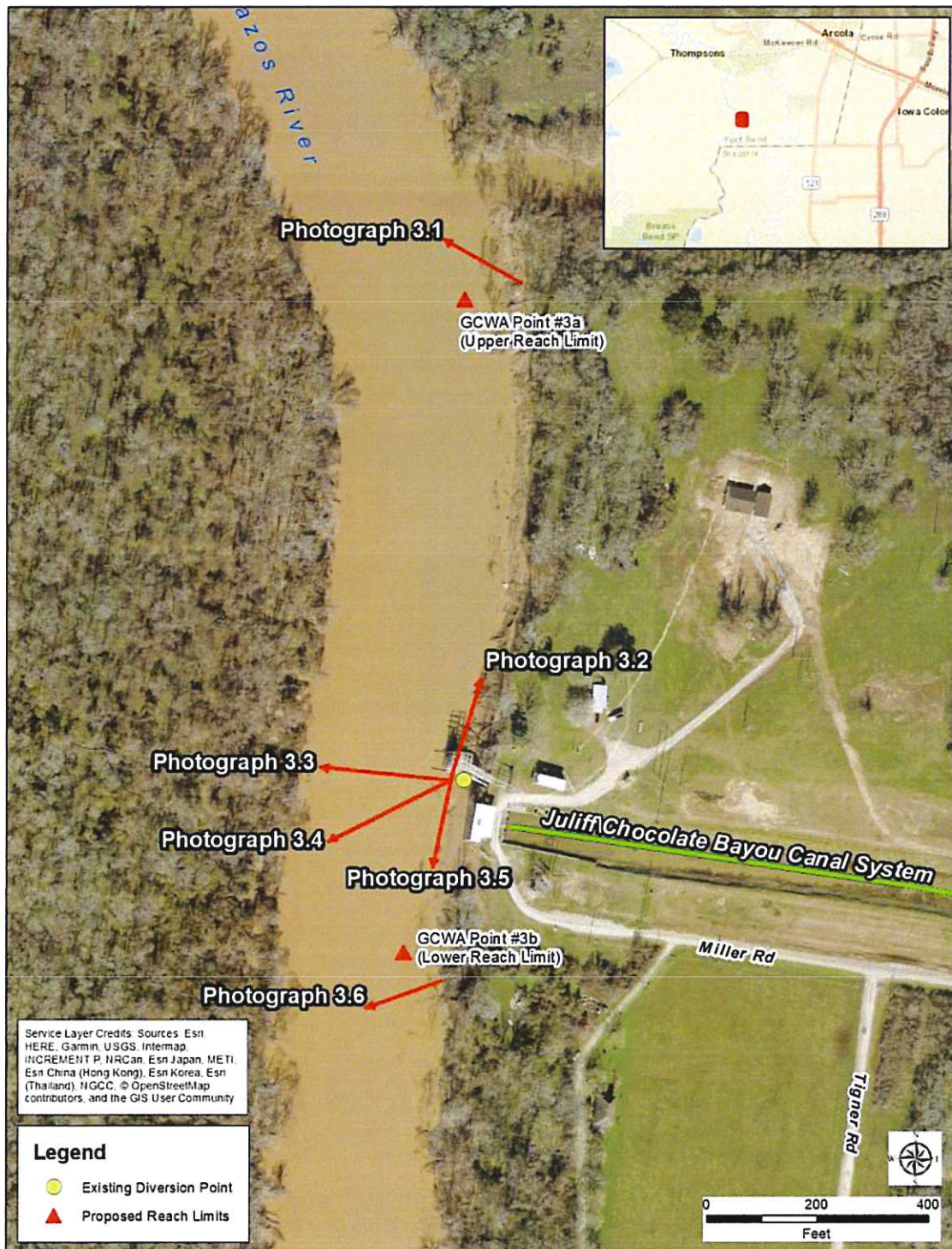
**Photograph 2.7. North of Intake Point, Looking South**





**Section 3 – Photographs of the River at Diversion Point 3\***

Figure 3-1. Map of Diversion Point Photographs



\*This diversion point is currently authorized by Certificate of Adjudication (CA) 12-5322. The application seeks to authorize this diversion point for CA 12-5168 and CA 12-5171. Photographs were taken at the nearest accessible location to project features.



**Photograph 3.1. North of Intake Point, Looking Upstream**



**Photograph 3.2. Intake Point, Looking Upstream**





**Photograph 3.3. Intake Point, Looking Across River**



**Photograph 3.4. Intake Point, Looking Downstream Across River**





**Photograph 3.5. Intake Point, Looking Downstream**



**Photograph 3.6. South of Intake Point, Looking Downstream**





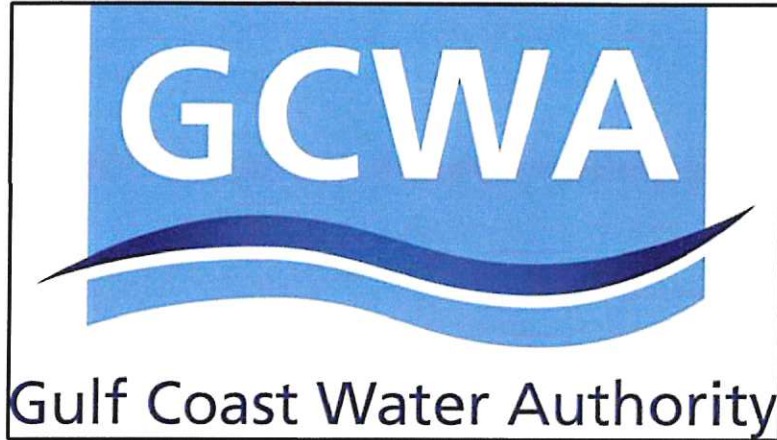
## **Section 4 – Impingement and Entrainment**

This application proposes using existing intake structures. The intake structure for the proposed amendment to CA 12-5322, the Shannon pump station (GCWA Point #1), is the same intake structure currently authorized to divert water under CA 12-5168 and 12-5171. The intake structure for the proposed amendments to CA 12-5168 and CA 12-5171, the Juliff pump station (GCWA Point #3), is the same intake structure currently authorized to divert water under CA 12-5322. The Briscoe pump station (GCWA Point #2) is already an authorized diversion point for all three rights (12-5168, 12-5171, and 12-5322). Because the applicant does not propose constructing new intakes at this time, the measures taken to avoid impingement and entrainment of aquatic organisms are the same as those on the existing structures. Any new GCWA intakes developed in the proposed reaches in the future at locations other than the existing diversion points would comply with the impingement and entrainment requirements applicable at the time of development.

## **Attachment 8**

Addendum to Worksheet 6.0:  
GCWA Water Conservation Plan

**WATER  
CONSERVATION  
PLAN FOR GULF  
COAST WATER  
AUTHORITY**



---


**October 2012**

**Prepared for:**

**GULF COAST WATER  
AUTHORITY**



FREESE AND NICHOLS, INC.  
TEXAS REGISTERED  
ENGINEERING FIRM  
F-2144

  
2012/10/12  
Jason D. Afinowicz, P.E.

FN0908

**Prepared by:**

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## **1.0 INTRODUCTION**

### **1.1 GULF COAST WATER AUTHORITY**

The Gulf Coast Water Authority (GCWA) is the major provider of water for Galveston County as well as a provider for Brazoria and Fort Bend Counties. GCWA was created by the Texas Legislature in 1965 to provide water supply services for municipal, domestic, manufacturing, agricultural irrigation, and other useful purposes to the inhabitants and water users of Galveston County.

The GCWA's raw water supply comes primarily from diversions from the Brazos River, with lesser amounts diverted from several named creeks and bayous. The GCWA has water rights totaling 449,432 acre-feet per year, and has contracts to purchase an additional 32,668 acre-feet per year from the Brazos River Authority. The GCWA has a long history of providing vital water supplies to substantial industrial users in Galveston County. Raw water supplies from GCWA constitute the majority of water use by these facilities. With the onset of groundwater regulation as a result of subsidence in the Galveston County area, GCWA has become a major provider of treated surface water to numerous Galveston County customers. Further groundwater regulation and an expanding population have also led GCWA to become a major raw water provider for municipal purposes in both Fort Bend and Brazoria Counties. Finally, GCWA's canal systems were largely developed for the irrigation of rice acreage in Brazoria and Galveston Counties. GCWA continues to provide water for this purpose to numerous customers, as well as irrigation of turf grass at golf courses. An overview of the GCWA system is shown in *Exhibit 1*.

The efficient use of water is essential to meeting all of GCWA's needs now and into the future. As the development of future water supplies will come at a higher cost than existing sources of water, it is important to maximize the efficient and judicious use of water across all categories of use.

## **1.2 TCEQ GUIDANCE AND RULES ON WATER CONSERVATION PLANS**

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation and drought contingency plans for public water suppliers. These TCEQ guidelines and requirements are included in *Appendix A*. The best management practices established by the Water Conservation Implementation Task Force, established pursuant to SB1094 by the 78th Legislature, were also considered in the development of the water conservation measures in this plan. GCWA has developed this water conservation and drought contingency plan following TCEQ guidelines and requirements. This plan replaces the Gulf Coast Water Authority's Water Conservation Plan and Drought Contingency Plan dated May 2009.

The objectives of this water conservation plan are as follows:

- To reduce water consumption from the levels that would prevail without conservation efforts,
- To reduce the loss and waste of water,
- To improve efficiency in the use of water,
- To document the level of recycling and reuse in the water supply,
- To extend the availability of firm water in a period of drought,
- To delay and decrease capital expenditures required to serve growth of GCWA's customer base, and
- To satisfy the requirements set forth by TCEQ and other agencies.

This plan includes all of the elements required by TCEQ. Some elements of this plan go beyond TCEQ requirements.

## 2.0 UTILITY AND SERVICE AREA DESCRIPTION

### 2.1 SERVICE AREA BOUNDARY

GCWA primarily functions as a water wholesaler for industrial, agricultural, and municipal water use in Brazoria, Fort Bend and Galveston Counties. GCWA serves water by open channel canals, pump stations, and pipelines. Because of this, the service area of the GCWA system is restricted within proximity to these various means of conveyance. *Exhibit 1* demonstrates the extent of the GCWA system.

### 2.2 CUSTOMER DATA

GCWA serves a variety of customers, including municipalities, utility districts, industrial operations, and agricultural operations. A list of GCWA customers along with their type of water use and the means of delivering the supply (conveyance system) from which they are served can be found below in *Table 2-1* through *Table 2-4*.

**Table 2-1: Summary of American, Briscoe, and Galveston Canal Customers**

Customer	Type of Water Use	Means of Supply
Ascend Materials	Industrial	Briscoe
Ashland	Industrial	Galveston
BTU (KV Land)	Industrial	Galveston
Lyondell	Industrial	Galveston
City of Texas City	Industrial	Galveston
Texas Brine Corporation	Industrial	American
Diamond K	Agricultural (Landscape)	Briscoe
First Colony Commons	Agricultural (Landscape)	American
First Commons Community Services (Flour)	Agricultural (Landscape)	American
Mag Creek Country Club	Agricultural (Landscape)	Galveston
Riverbend Country Club	Agricultural (Landscape)	American
Southwyck Country Club	Agricultural (Landscape)	Briscoe
Sugar Creek Country Club	Agricultural (Landscape)	American
Sugar Land	Agricultural (Landscape)	American
Texas City Golf Course	Agricultural (Landscape)	Galveston
Ft. Bend WCID No. 2	Municipal (Wholesale Raw)	American
Missouri City	Municipal (Wholesale Raw)	Briscoe



Customer	Type of Water Use	Means of Supply
Pearland	Municipal (Wholesale Raw)	American
Pecan Grove MUD	Municipal (Wholesale Raw)	American
Sugar Land	Municipal (Wholesale Raw)	American
Rice Farmers on American, Briscoe and Galveston Canal System	Agricultural	American, Briscoe, and Galveston

**Table 2-2: Summary of Thomas Mackey Water Treatment Plant Customers**

Customer	Type of Water Use	Means of Supply
Bacliff MUD	Municipal (Wholesale Treated)	TMWTP
Bayview MUD	Municipal (Wholesale Treated)	TMWTP
City of Galveston	Municipal (Wholesale Treated)	TMWTP
City of Texas City	Municipal (Wholesale Treated)	TMWTP
GC FWSD #6 (Tiki Island)	Municipal (Wholesale Treated)	TMWTP
GC WCID #1 Dickinson	Municipal (Wholesale Treated)	TMWTP
GC WCID #12 (Kemah, Clear Lake Shores)	Municipal (Wholesale Treated)	TMWTP
San Leon MUD	Municipal (Wholesale Treated)	TMWTP
City of Hitchcock	Municipal (Wholesale Treated)	TMWTP
City of La Marque	Municipal (Wholesale Treated)	TMWTP
City of League City	Municipal (Wholesale Treated)	TMWTP
GC MUD #12 (Bayou Vista)	Municipal (Wholesale Treated)	TMWTP
GC WCID #8 (Santa Fe)	Municipal (Wholesale Treated)	TMWTP
NRG Texas LP	Industrial (Wholesale Treated)	TMWTP

**Table 2-3: Summary of Industrial Pump Station Customers**

Customer	Type of Water Use	Means of Supply
BP (Texas Refining)	Industrial	IPS
Dow	Industrial	IPS
Equistar	Industrial	IPS
Valero	Industrial	IPS
Marathon Petroleum	Industrial	IPS
City of Texas City	Industrial	IPS
Eastman	Industrial	IPS

**Table 2-4: Summary of Chocolate Bayou Canal Customers**

Customer	Type of Water Use	Means of Supply
INEOS	Industrial	Chocolate Bayou Canal
Rice Farmers on Chocolate Bayou Canal	Agricultural	Chocolate Bayou Canal
Rice Farmers on Juliff Canal	Agricultural	Juliff Canal

### 2.3 CURRENT AND PROJECTED POPULATION

The GCWA serves a variety of municipal customers through both treated water infrastructure and raw water canal conveyances. This fundamentally divides these customers into two categories. Furthermore, GCWA is responsible for serving only a portion of the service areas of some of its municipal customers, and this portion varies by customer and from year to year depending on alternative sources such as groundwater wells or water from other wholesalers.

Population data was developed from a number of sources. Where necessary, various sources of information were utilized including, in order of decreasing preference:

- Data from customer surveys
- Harris Galveston Subsidence District (HGSD) Regulatory Plan Update Project
- Data from Customer-Developed Groundwater Reduction Plans
- Water User Group Data from the 2012 State Water Plan
- Harris-Galveston Area Council population projections

Because of the complex nature of the customers who are served only partly by supplies from GCWA, a survey of customers was conducted to determine long-term population projections as well as other pertinent information. This source was considered the most accurate depiction of the population within the service area. Another primary source of information for completing this dataset is information from the ongoing Regulatory Plan update project being pursued by Harris Galveston Subsidence District (HGSD). This project includes the development of population projections by HGSD's consultant, the University of Houston's Center for Public Policy, and housing market information provider Metrostudy,

and is being performed alongside regional stakeholders. These projections are intended for use in the development of the 2016 Regional Water Plan for Region H.

Representative populations served from both the treated water system and the raw water conveyances are shown in *Table 2-5* and *Table 2-6*. Wherever possible, these populations are intended to represent the portion of a customer's population served by water supplied by GCWA. The source of the data for each customer is also listed in the tables. If the customer did not provide projections through 2070, the projections for the "blank" years were calculated by using the trend in the HGSD projections applied to the latest projection year. For customers that get a significant portion of water from another supplier, the total population of their service area is shown in parentheses below the portion served by GCWA.



**Table 2-5: Representative Population Projections for Treated Water Customers**

Customer	Data Source	Population Projection for Year						
		2010	2020	2030	2040	2050	2060	2070
Bacliff MUD	Survey	7,856	9,082	10,412	11,202	12,262	13,686	14,746
Bayview MUD	HGSD	1,430	1,410	1,482	1,561	1,643	1,730	1,821
City of Galveston	HGSD	47,589	51,086	54,444	57,619	60,696	63,645	66,746
City of Texas City	Survey/HGSD	45,111	48,661	55,653	59,239	62,329	65,060	67,537
GC FWSD #6 (Tiki Island)	Survey	964	1,042	1,149	1,266	1,396	1,500	1,500
GC WCID #1 (Dickinson)	Survey/HGSD	21,398	26,108	27,811	28,689	29,543	30,384	31,220
GC WCID #12 (Kemah, Clear Lake Shores)	HGSD	2,320	4,205	4,982	5,081	5,159	5,222	5,274
San Leon MUD	HGSD	4,983	5,623	6,146	6,555	6,965	7,375	7,784
City of Hitchcock	HGSD	6,726	8,308	9,871	10,899	11,701	12,337	12,847
City of La Marque	HGSD	14,397	19,840	21,700	22,146	22,510	22,815	23,075
City of League City	Survey/HGSD	7,761 (83,427)	10,859 (116,736)	15,171 (163,083)	18,425 (198,072)	19,234 (206,761)	19,699 (211,770)	20,018 (215,198)
GC MUD #12 (Bayou Vista)	Survey/HGSD	2,500	2,520	2,522	2,525	2,527	2,529	2,530
GC WCID #8 (Santa Fe)	Survey/HGSD	6,500	7,410	9,500	9,531	9,563	9,596	9,629
<b>TOTAL</b>		<b>169,533 (237,345)</b>	<b>196,153 (302,031)</b>	<b>220,844 (368,755)</b>	<b>234,739 (414,385)</b>	<b>245,528 (433,055)</b>	<b>255,578 (447,649)</b>	<b>264,728 (459,907)</b>

The City of Texas City responded to the survey with the current population and projections for 2015 and 2020. The trend from the HGSD projection was calculated and added to the survey data for 2030 through 2070.

GC WCID #1 (Dickinson) responded to the survey with the current population and projections for 2020 through 2030. The trend from the HGSD projection was calculated and added to the survey data for 2040 through 2070.

The City of League City responded to the survey with the current population and projections for 2015 through 2035. The trend from the HGSD projection was calculated and added to the survey data for 2040 through 2070. Further, the City of League City gets 21.5 MGD from a source other than GCWA in addition to the contract for 2 MGD from TMWTP. It was assumed that the ratio of GCWA contracts to other contracts was the distribution of population served by GCWA, or approximately 9% of the total service area.

GC MUD #12 (Bayou Vista) responded to the survey with the current population and projections for 2015. The trend from the HGSD projection was calculated and added to the survey data for 2020 through 2070.

GC WCID #8 (Santa Fe) responded to the survey with the current population and projections for 2015 through 2030. The trend from the HGSD projection was calculated and added to the survey data for 2040 through 2070.

**Table 2-6: Representative Population Projections for Raw Water Customers**

Customer	Data Source	Population Projection for Year						
		2010	2020	2030	2040	2050	2060	2070
City of Pearland	Survey/HGSD	0 (91,975)	65,250 (145,000)	113,750 (160,000)	113,750 (175,000)	113,750 (175,000)	115,570 (175,000)	124,568 (175,000)
City of Sugar Land	HGSD	0 (73,997)	25,659 (85,530)	56,931 (94,885)	61,081 (101,801)	65,008 (108,346)	68,235 (113,725)	70,330 (117,217)
FB WCID #2	HGSD	0 (28,865)	18,504 (30,840)	19,949 (35,915)	21,549 (35,915)	22,570 (37,616)	23,468 (39,114)	24,397 (40,662)
Pecan Grove MUD	HGSD	0 (15,963)	4,838 (16,128)	9,699 (16,165)	9,730 (16,216)	9,755 (16,259)	9,778 (16,296)	9,797 (16,329)
City of Missouri City	Survey/HGSD	0 (67,358)	51,059 (100,749)	102,591 (120,749)	119,496 (140,846)	120,742 (160,951)	120,742 (175,941)	120,742 (186,577)
<b>TOTAL</b>		<b>0 (278,158)</b>	<b>165,310 (378,247)</b>	<b>302,920 (427,714)</b>	<b>325,605 (469,778)</b>	<b>331,825 (498,172)</b>	<b>335,973 (520,076)</b>	<b>339,017 (535,785)</b>

The City of Pearland responded to the survey with population projections for 2015 through 2035. The HGSD population projections were lower than the survey projections until 2060. The population for Pearland was assumed to remain constant at 175,000 people from 2040 through 2050 and resumed the HGSD trend from 2060 through 2070. The percentage of population served by GCWA was calculated by the mandatory requirements of surface water conversion outlined in the City of Pearland Groundwater Reduction Plan (GRP).

The City of Sugar Land did not respond to the survey, therefore HGSD population projections were used for 2010 through 2070. The percentage of population served by GCWA was calculated by the mandatory requirements of surface water conversion outlined in the City of Sugar Land GRP.

FB WCID #2 did not respond to the survey, therefore HGSD population projections were used for 2010 through 2070. The percentage of population served by GCWA was calculated by the mandatory requirements of surface water conversion outlined in the FB WCID #2 GRP.

Pecan Grove MUD did not respond to the survey, therefore HGSD population projections were used for 2010 through 2070. The percentage of population served by GCWA was calculated by the mandatory requirements of surface water conversion outlined in the Pecan Grove MUD GRP.

The City of Missouri City responded to the survey with the current population and population projections from 2015-2070.

Table 2-7 shows the HGSD population projections for Brazoria, Fort Bend, and Galveston Counties from 2010 to 2070 for reference.

**Table 2-7: Countywide Population Projections**

Customer	Data Source	Population Projection for Year						
		2010	2020	2030	2040	2050	2060	2070
Brazoria County	HGSD	313,166	359,935	411,387	437,637	463,886	519,696	581,368
Fort Bend County	HGSD	585,375	881,966	1,095,123	1,177,215	1,259,307	1,421,933	1,583,782
Galveston County	HGSD	291,309	343,570	377,373	390,597	403,820	427,547	447,126
<b>TOTAL</b>		<b>1,189,850</b>	<b>1,585,471</b>	<b>1,883,883</b>	<b>2,005,448</b>	<b>2,127,013</b>	<b>2,369,176</b>	<b>2,612,276</b>

## 2.4 WATER USE DATA

Evaluation of current levels of water use is essential to identifying opportunities for implementing water conservation practices and then evaluating performance over time. Due to the diverse nature of customers supplied by GCWA, this plan examines municipal demand in terms of gallons per capita per day (GPCD) and examines industrial and agricultural water demand in terms of volume in acre-feet per year.



### 2.4.1. Municipal

A commonly used tool to understand municipal water demand and usage is GPCD. This metric is calculated by dividing the water used per day, including residential, commercial, and other uses, by the population of the area served. A summary of the estimated current municipal water demand (in GPCD) of GCWA customers is shown in *Table 2-8*. The current GCWA water demand for all municipal customers is approximately 143.4 GPCD. The total municipal water demand for the previous five years is shown in *Table 2-9*.

**Table 2-8: Current Municipal Water Demand**

Customer	Water Demand in GPCD	Source
Bacliff MUD	74.0	Survey
Bayview MUD	72.7	HGSD
City of Galveston	200.0	Survey
City of Texas City	129.0	Survey
GC FWSD #6 (Tiki Island)	234.0	Survey
GC WCID #1 (Dickinson)	105.0	Survey
GC WCID #12 (Kemah, Clear Lake Shores)	170.0	HGSD
San Leon MUD	108.0	HGSD
City of Hitchcock	110.2	Calculated from Usage
City of La Marque	150.3	Calculated from Usage
City of League City	143.0	Calculated from Usage
GC MUD #12 (Bayou Vista)	162.7	Survey
GC WCID #8 (Santa Fe)	78.4	Calculated from Usage
City of Pearland	109.0	Survey
City of Sugar Land	185.0	HGSD
FB WCID #2	261.0	HGSD
Pecan Grove MUD	177.0	HGSD
City of Missouri City	176.0	Survey

**Table 2-9: Current Total Municipal Water Demand**

	Municipal Water Demand in Acre-Feet for Year				
	2007	2008	2009	2010	2011
TOTAL	34,861	35,860	36,041	30,700	36,016

### 2.4.2. Industrial

GCWA supplies raw water to industry in Galveston County through a pump station and pipeline at the end of the Galveston Canal system. Industrial use in Fort Bend and Brazoria Counties is provided through canal conveyance. Industrial operations use water in such a way that GPCD is not an accurate portrayal of the water demand, so it is measured by total volume in acre-feet per year. The total volume delivered for industrial use for the past five years is shown in *Table 2-9*.

**Table 2-10: Current Industrial Water Demand**

Customer	Industrial Water Demand in Acre-Feet for Year				
	2007	2008	2009	2010	2011
American Canal	297.4	503.1	590.7	576.9	1,057.1
Briscoe Canal	14,058.8	13,133.0	9,511.4	9,735.3	9,294.3
Galveston Canal	63,694.3	63,013.7	66,236.2	65,802.7	71,675.3
Chocolate Bayou Canal	12,131	12,131	12,131	12,131	15,555

### 2.4.3. Agricultural

GCWA generally supplies raw water to agricultural customers in Brazoria and Fort Bend Counties via canal. The agricultural customers include several rice farming operations as well as a few golf courses. The estimated total volume delivered for agricultural use for the past five years is shown in *Table 2-10*. The estimates are calculated using the certified acreage for the first and second crops and typical application rates for rice farming.

**Table 2-11: Current Agricultural Water Demand**

	Agricultural Water Demand in Acre-Feet for Year				
	2007	2008	2009	2010	2011
TOTAL	21,805	40,707	44,050	46,452	60,322

## 2.5 WATER SUPPLY SYSTEM

GCWA is authorized to divert water from the Brazos River as well as Jones and Oyster Creeks in Fort Bend County and Chocolate, Halls, and Mustang Bayous in Brazoria County in order to meet the water needs of the customers. Diversions from Jones and Oyster Creeks are used to supply water for agricultural, municipal, and industrial uses to customers in Fort Bend and Brazoria Counties. A summary of GCWA's Certificate of Adjudication (COA) numbers are shown below in *Table 2-11*.

Table 2-12: GCWA Water Rights Summary

COA Number	Priority Year	Description	System	Use Code	Permitted Diversion (Ac-Ft/Yr)
5168	1926	Brazos River diversion	ABG	1,2,3	99,932
	1947	7,308 Ac-Ft storage		13	
	1999	65 Ac-Ft storage		2	
5169	1948	Jones/Oyster Creek diversion 8925.48 Ac-Ft storage	ABG	1,2,3,7	12,000
5171	1939	Brazos River diversion	ABG	1,2,4	75,000
	1950			3	50,000
5322	1929	Juliff Plant 864 Ac-Ft storage for pumping	Chocolate Bayou	1,2,3	155,000
5357	1937	Choc. Bayou, Mustang Bayou, Halls Bayou	Chocolate Bayou	1,3,7	57,500
	1976	8,951 Ac-Ft storage		2	
TOTAL					449,432

Use Codes:

1 – Municipal/Domestic

2 – Industrial

3 – Irrigation

4 – Mining

5 – Hydroelectric

6 – Navigation

7 – Recreation

8 – Other

9 – Recharge

11 – Domestic and Livestock

13 – Storage

The majority of agricultural irrigation use for GCWA customers is in Brazoria County, although GCWA provides some water for irrigation use in Galveston and Fort Bend Counties. GCWA maintains and operates canal systems, reservoirs, and pump stations that serve irrigation and other uses of water. The systems work collectively to serve the customers.

GCWA also purchases water from the Brazos River Authority (BRA). The BRA water is purchased under three separate contracts, one for 30,020 acre-feet per year, one for 9,335 acre-feet per year, and one for 5,625 acre-feet per year. GCWA must request the release of the water from upstream reservoirs controlled by BRA. Once released, GCWA diverts the water from the Brazos River. These contracts are typically used in times of low flow in the Brazos River.

### 2.5.1. American Canal System

A map of the American Canal System is shown in *Exhibit 2*. The American Canal System consists of two sections, Section 1 and Section 2. Section 1 extends from the Brazos River to the Second Lift Station (Second Lift), and Section 2 extends from the Second Lift Station to the terminus near League City. Section 1 is primarily the natural streambed of Jones Creek and Oyster Creek and Section 2 is primarily earthen canal.



In whole, the American Canal System is comprised of the Shannon Plant pump station, Jones Creek and Oyster Creek, Oyster Creek Lake, and seven adjoining lakes. The system has approximately 72 miles of natural creek and man-made canals with 381 acres of lake area. The Shannon Plant includes three pumps that divert water from the Brazos River into the American Canal System. The pumps include one 41,000-GPM and two 50,000-GPM. Water pumped from the Shannon Plant is measured by Parshall flume two miles downstream of the diversion point. The American Canal System has a lift station further downstream in Sugar Land with two 42,000-GPM pumps and one 40,000-GPM pump. The volume of water pumped is metered at Second Lift.

Lateral 10 is shown in the comprehensive *Exhibit 1*. The Lateral 10 canal is a lateral that connects the American and Briscoe Systems and allows for the passage of flow from the former conveyance to the latter. Lateral 10 is located in Brazoria County near Manvel.

### **2.5.2. Briscoe Canal System**

A map of the Briscoe Canal System is shown in *Exhibit 3*. The Briscoe Canal System runs south of and parallel to Highway 6 from the Briscoe Pump Station (Briscoe Plant) on the Brazos River six miles west of Arcola to the Monsanto and Ranch Canals south of Alvin. Beyond the Monsanto and Ranch Canals, the Briscoe Canal System connects to the Galveston Canal System. The Briscoe Plant has three 70,000-GPM pumps that divert water from the Brazos River into the Briscoe Canal System. The Briscoe Canal System has approximately 51 miles of man-made canals.

### **2.5.3. Galveston Canal System**

A map of the Galveston Canal System is shown in *Exhibit 4*. The approximately 17 mile long Galveston System connects the American and Briscoe Systems. The Galveston Canal System is also used to route flow into the GCWA Reservoir and on to municipal and industrial customers in Galveston County.

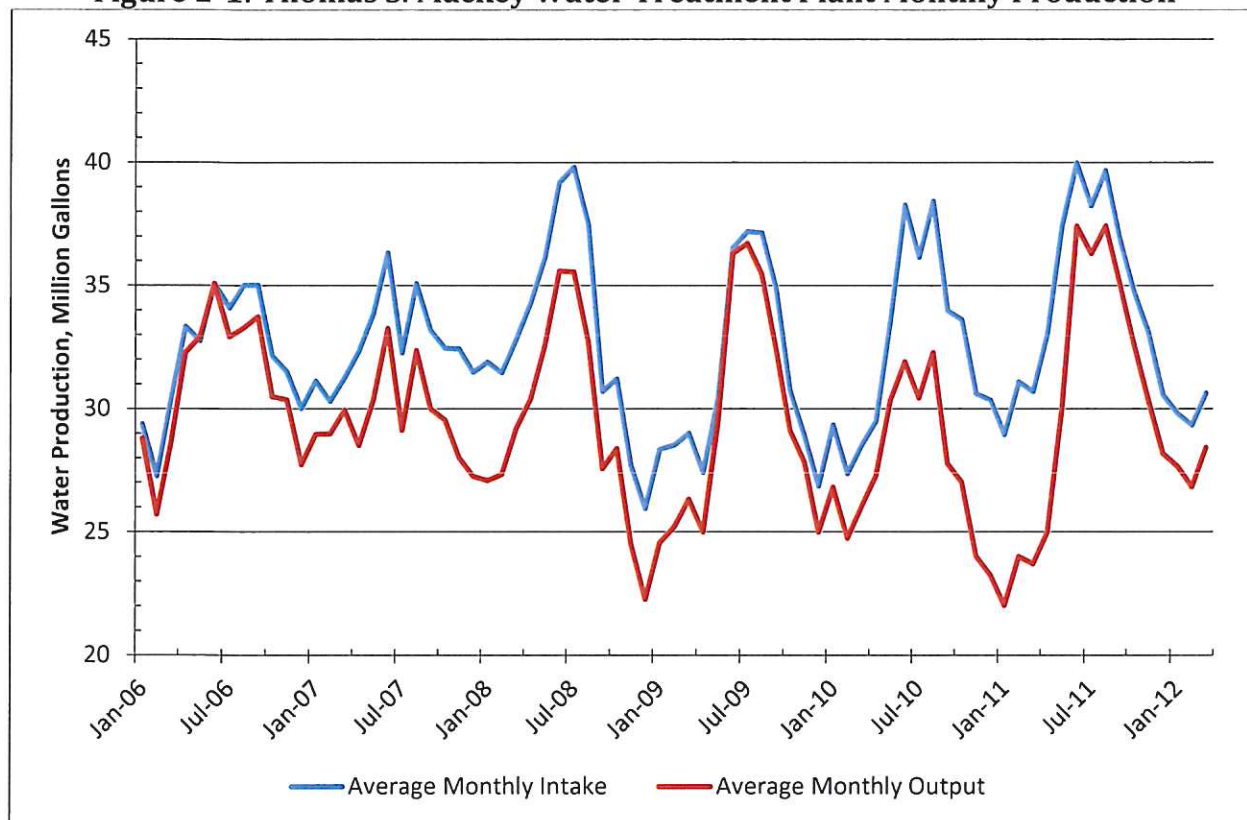
#### 2.5.4. Industrial Canal and Industrial Pump Station

The Industrial Pump Station (IPS) pumps water from the Industrial Canal in Texas City through a 42-inch and a 36-inch pipeline to industrial customers within a 3-mile radius in Galveston County. Each of the pipelines are equipped with flow meters that record the amount of water delivered to customers. The Terminal Reservoir located at the terminus of the Industrial Canal is considered part of the Industrial System.

#### 2.5.5. Thomas S. Mackey Water Treatment Plant

The Brazos River provides source water for the Thomas S. Mackey Water Treatment Plant (TMWTP) in Texas City. The water treatment plant is rated to 50 MGD, with 9 million gallons of on-site storage capacity at the treatment plant. From the plant, water is distributed through two major pipeline systems, which terminate at each customer's meter site. *Figure 2-1* shows the average water intake and output in million gallons of the TMWTP from January 2006 to March 2012. The difference in intake and output is recycled to Industrial customers.

**Figure 2-1: Thomas S. Mackey Water Treatment Plant Monthly Production**



### **2.5.6. Chocolate Bayou Canal System and Juliff Canal System**

A map of the Chocolate Bayou Canal System is shown in *Exhibit 5*. The Chocolate Bayou Canal System extends approximately 2.3 miles northeast of Chocolate Bayou near Liverpool. The Chocolate Bayou Canal System delivers water to area farmers and an industrial customer.

The Chocolate Bayou Canal System also includes the Juliff Canal System. A map of the Juliff Canal System is shown in *Exhibit 6*. The Juliff Canal System has several branches and extends from the Brazos River near Juliff to approximately five miles east of Danbury. The Juliff Canal System delivers water to area farmers.

### **2.5.7. Reservoirs**

GCWA operates and maintains several reservoirs in its system. A comprehensive list of reservoirs includes:

- A 7,308 ac-ft off-channel reservoir dedicated to industrial and municipal customers in Texas City known as the GCWA Reservoir,
- A combined 8,925.48 ac-ft reservoir of impounded runoff in joint use with The City of Sugar Land in Jones and Oyster Creeks in Fort Bend County,
- The 65 ac-ft Terminal Reservoir dedicated to industrial customers in Texas City,
- Three off-channel reservoirs in Brazoria County totaling 8,951 ac-ft of storage, and
- Three off-channel reservoirs in the Juliff and Chocolate Bayou Canal Systems in Fort Bend and Brazoria Counties totaling 864 ac-ft.

### **2.5.8. Delivery to Customers**

All GCWA canals are earthen open channel flow conveyances. The canal system is in good condition and is maintained regularly as required for system reliability. Delivery to industrial customers in the general Texas City area is performed through a pipeline system originating at the Industrial Pump Station (IPS) with the exception of one customer that diverts raw water directly from the canal system downstream of GCWA Reservoir. Municipal raw water customers also make diversions directly from the American and Briscoe Canal systems.



Municipal treated water customers receive water from the TMWTP through a system of pipelines. Generally, these customers are divided between service from the North Potable System (eight customers) and the South Potable System (eight customers).

All agricultural and two golf course customers have gravity flow through pipes with screw gates. Three golf course customers pump water from the American System, which is metered by flow meters in the pumping systems.

## **2.6 AGRICULTURAL SYSTEM INVENTORY**

The GCWA serves a variety of traditional agricultural water users as well as users who irrigate golf courses and other green spaces. The majority of agricultural irrigators are located in Brazoria County and this area represents the largest demand for agricultural water served by GCWA. There is a smaller, yet still significant contingent of agricultural users in Galveston County served by the American, Briscoe, and Galveston Canal System. Landscape (typically golf course) irrigation is generally located in Fort Bend and Galveston Counties.

### **2.6.1. Structural Facilities**

The American System, Briscoe System, Chocolate Bayou Canal System, and the Jones Creek off-channel reservoir serve GCWA agricultural customers. The canals are generally earthen channels with metal screw gate diversion points.

### **2.6.2. Agricultural Management Practices**

Agricultural customers currently have annual contracts and divert water from the main canals as needed.

### **2.6.3. User Profile**

The service area of GCWA is approximately 17,000 acres in Brazoria and Galveston Counties for the purposes of irrigated agriculture.

## **2.7 WASTEWATER SYSTEM**

GCWA does not operate a wastewater system although GCWA customers may maintain their own wastewater systems.

### 3.0 APPROACH TO WATER CONSERVATION

#### 3.1 SPECIFIC CONSERVATION GOALS

As outlined in Title 30 Chapter 288, each water conservation plan must include specific, quantified conservation goals. Because GCWA serves a wide variety of customers using different delivery systems, the goals are separated into specific system-wide goals, wholesale municipal goals, wholesale industrial goals, and agricultural goals.

It is important to note that GCWA only has direct responsibility for the implementation of water conservation measures within its own system. Conservation measures implemented by the customers of GCWA and their subsequent customers are the responsibility of those individual entities. However, GCWA encourages the voluntary conservation measures by its customers listed in the sections below.

##### 3.1.1. GCWA System

The goals for this water conservation plan for the GCWA system as a whole include the following:

- Implement and maintain a program of universal metering and meter replacement and repair, as shown in *Table 3-1* and further discussed in *Section 3.2.3*.
- Maintain the amount of water loss at Thomas S. Mackey Water Treatment Plant as shown in *Table 3-1*.
- Maintain or reduce the amount of water loss in the GCWA treated water system (from TMWTP to customer take points) as shown in *Table 3-1*.

**Table 3-1: GCWA System Conservation Goals**

Strategy	5-year Goal	10-year Goal
System Metering	Have the system metered all uses	Use meters to get finer detail for water accounting
Water Loss Prevention TMWTP	Maintain water loss at 10% or less	Maintain water loss at 10% or less
Water Loss Prevention System for Treated Water System	Maintain water loss at 20% or less	Reduce water loss to 15% or less

### **3.1.2. Wholesale Municipal**

The goals in this water conservation plan for the GCWA municipal wholesale customers include the following:

- Work with customers in order to reduce demands below the specified amount in gallons per capita per day listed in *Table 2-8*, toward an ultimate goal of 140 gpcd.

### **3.1.3. Wholesale Industrial**

The goals in this water conservation plan for the GCWA industrial customers include the following:

- Work with customers to increase efficient water usage where practicable.
- Work with customers to increase the amount of water recycled in-plant where practicable.

### **3.1.4. Agricultural and Irrigation Use**

The goals in this water conservation plan for the GCWA agricultural and irrigation customers include the following:

- Work with rice irrigators to encourage the efficiency of water use through precision leveling and other on-farm methods.
- Within 5 years, implement metering for rice irrigators in order to track volume consumed rather than area irrigated.
- Within 5 years, modify future contracts to require landscape irrigation customers to have water conservation plans in place.
- Within 10 years, use the information gained from metering to achieve finer detail in water accounting.

## **3.2 GCWA SYSTEM CONSERVATION PRACTICES**

There are several conservation practices that may be implemented by GCWA to increase the efficiency of their water supply systems. These practices are fully within the control of GCWA and are not subject to the efforts of customer and end users.

### **3.2.1. Description of Practices Utilized to Measure and Account for Diversions**



Conservation begins with the implementation of proper water measurement procedures within the GCWA system. Means of flow measurement varies from system to system.

Water diverted from the Brazos River is measured by a Parshall flume and is metered. Water is also metered at the outlet of the GCWA Reservoir by open channel flow meters located at the reservoir outlets. Inflow at the water treatment plant is metered with a full port magnetic meter.

The outflow from the Industrial Pumping Station is routed through one 36" and one 42" line. Each of these lines is equipped with a Venturi meter. The pressure drop through each meter is measured with a Rosemont pressure transducer and flow is derived from the measured pressure drop.

GCWA has two different methods of metering agricultural customer water usage. For the majority of agricultural customers, GCWA has a system where orders for water are recorded for long-term documentation of water use. The remaining agricultural customers have meters that are read monthly.

In addition to the abovementioned practices, GCWA is also developing a Water Accounting Plan. The accounting plan will allow GCWA to more accurately account for diversions within the different systems.

### **3.2.2. Monitoring and Record Management**

GCWA uses a Supervisory Control and Data Acquisition (SCADA) system to acquire data and control SCADA sites. SCADA site data is collected and monitored at the water treatment plant continuously. Customer meter sites are inspected and meter readings are recorded at a minimum of once per month.

Records are kept in accordance with TCEQ rules and regulations and the GCWA Records Management Policy. This policy adopts records control schedules that comply with records retention schedules issued by the Texas State Library and Archives Commission as provided by §203.041(a)(2), Local Government Code.

### **3.2.3. Metering and Leak Detection and Repair**

Delivery of water to all customers, including municipal, industrial, and agricultural users should be metered in some form. Although many customers have take-or-pay contracts that do not require the exact amount of water delivered to be known, the ability to account for water delivered at each take point is essential to the purposes of water conservation.

The flow data from TMWTP is regularly monitored to identify potential losses, and physical inspection along with the potable distribution system is performed regularly to identify leaks. Ground storage tanks and clear wells are inspected annually, at a minimum. Customer meter sites are regularly checked for the evidence of leaks as well as annual meter calibration.

Canals and pipelines are continually monitored for leaks or necessary service up to the customer boundary. GCWA Water Tenders police fields daily for water loss.

#### **3.2.4. System Operations Plan**

GCWA does not own or operate a series of major reservoir within a common watershed of a river basin. However, GCWA does operate a number of canal systems and pump stations that lend themselves to system operation to maximize efficient use of supply. GCWA is currently in the process of evaluating the operation of its system and will incorporate beneficial management practices identified as part of this effort.

#### **3.2.5. Reuse and Recycling of Wastewater**

As mentioned in *Section 2.7*, GCWA does not operate a wastewater system. However, municipal and industrial customers of the system do operate wastewater facilities that may prove to be viable water supply sources. GCWA is currently exploring opportunities to take advantage of this resource in reducing the demand of fresh water within the service area and these practices will be implemented as they become economically feasible.

#### **3.2.6. Public Education**

As part of a public education effort GCWA is including links to water conservation resources through the updated website. In addition, GCWA will continue efforts to reach out to the community through presentations and general information related to water conservation.

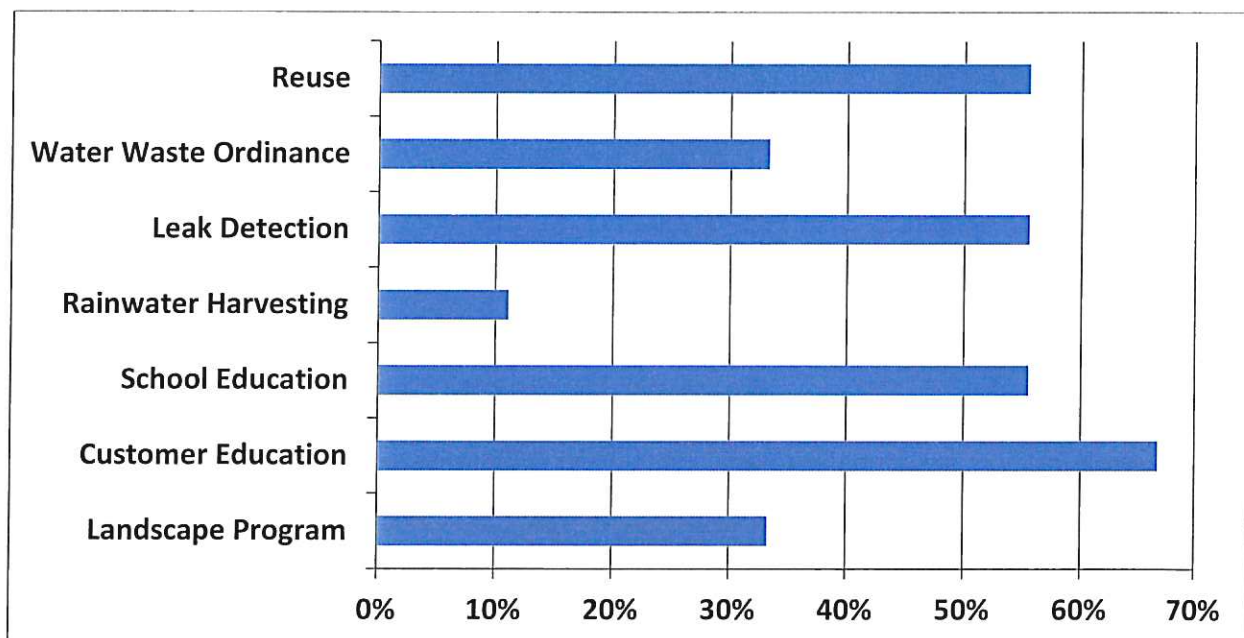
### **3.3 RECOMMENDED CUSTOMER CONSERVATION PRACTICES**

As a wholesale water provider, GCWA has limited opportunity to implement conservation measures that affect water use after the water leaves the GCWA system. However, GCWA does encourage responsible and efficient water use by its customers and makes several recommendations for conservation practices to be used by their customers.

### 3.3.1. Municipal Conservation Practices

Most GCWA municipal customers are required to develop and follow their own water conservation plans that contain practices that are specific to those individual water systems. All customers were surveyed in the development of this document regarding several aspects of their water use as well as their approach to water conservation. A summary of the responses received is shown in *Figure 3-1*. The results demonstrate that customers are already actively involved in conservation measures or planning to implement them in the near-term. Educational programs to either customers or students are very common practices. Leak detection has also been implemented on a fairly widespread basis based on the responses received. Finally, reuse projects are in place or are being implemented by numerous customers in a wide range of scales from the use of reclaimed water at wastewater facilities or widespread direct reuse for agricultural purposes.

**Figure 3-1 - Summary of GCWA Municipal Customers Planning or Participating in Various Water Conservation Practices**



Although GCWA is not ultimately responsible for the implementation of water conservation measures by its wholesale municipal customers, GCWA does support the implementation of various measures on a voluntary basis. Specifically, GCWA recommends the following measures for responsible and efficient use of water by wholesale municipal customers:



- **Customer Education:** Efforts to educate customers about issues regarding water conservation often provided through mailouts with customer billing. However, programs may also include public awareness and advertising.
- **School Education:** Programs that educate students about the importance of water conservation. Programs such as WaterWise, sponsored by HGSD allow retail entities a simplified approach to applying such efforts, while programs such as TWDB's WaterIQ offer other opportunities for outreach in schools.
- **Leak Detection:** System water audits and water loss programs are effective methods of accounting for all water usage by a utility within its service area. Performing a reliable water audit is the foundation of proper water resource management and loss control in public drinking water systems.
- **Water Waste Ordinance:** Prohibition (by ordinance) of specific wasteful activities. This includes such things as: water wasted during irrigation, continuously running water from garden hoses resulting in water spilling into street, failure to fix outside faucet leaks, service line leaks (on the retail customer side of the meter), sprinkler system leaks, once-through use of water in commercial equipment, non-recirculation systems in in-bay automatic car washes, and non-recycling decorative fountains.
- **Water Rate Structures:** Water rate structures that discourage over-consumption of water. Each municipal customer of GCWA is encouraged to have a rate structure that is either flat or increasing as consumption increases. This type of structure discourages residential water use in high volumes beyond typical household use volumes.

### **3.3.2. Application of Equipment and Processes to Improve Industrial Water Use Efficiency**

GCWA encourages the implementation of conservation measures to increase efficient water use for industrial purposes. It is recognized that these practices will be implemented in a manner specific to each industrial process as customers identify a potential net benefit of reducing water consumption. Similarly, the use of reclaimed water in industrial processes will be implemented when it becomes advantageous to the user.

### **3.3.3. Program for Assisting Customers in Development of On-Farm Practices**

GCWA encourages the use of precision leveling and other methods of reducing on-farm water demand for rice production. Additionally, the metering program described above aims to better quantify and evaluate demands in order to aid in the efficient use of water.

## **4.0 IMPLEMENTATION**

### **4.1 ADOPTION, CONTRACTUAL REQUIREMENTS, AND MEANS FOR IMPLEMENTATION AND ENFORCEMENT**

As part of GCWA's water conservation plan, a requirement exists in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of Title 30 TAC Chapter 288. If GCWA's customer intends to resell water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of Title 30 TAC Chapter 288.

This plan was adopted by Gulf Coast Water Authority via a resolution passed by the Board of Directors on September 20, 2012. A copy of this resolution may be found in *Appendix E* of this document.

### **4.2 COORDINATION WITH REGIONAL WATER PLANNING GROUP**

A copy of this Water Conservation Plan and GCWA's Drought Contingency Plan have been provided to the Region H Water Planning Group. A copy of the transmittal letter can be found in *Appendix F* of this document.

### **4.3 REVIEW AND UPDATE OF WATER CONSERVATION PLAN**










As required by TCEQ rules, GCWA will review and update this plan, as appropriate based on an assessment of previous five and ten year targets and any other new or updated information. GCWA will review and update the Plan no later than September 20, 2017, and every five years after that date to satisfy TCEQ requirements. Implementation reports will also be developed annually for submittal to TCEQ regarding progress in achieving water conservation goals.

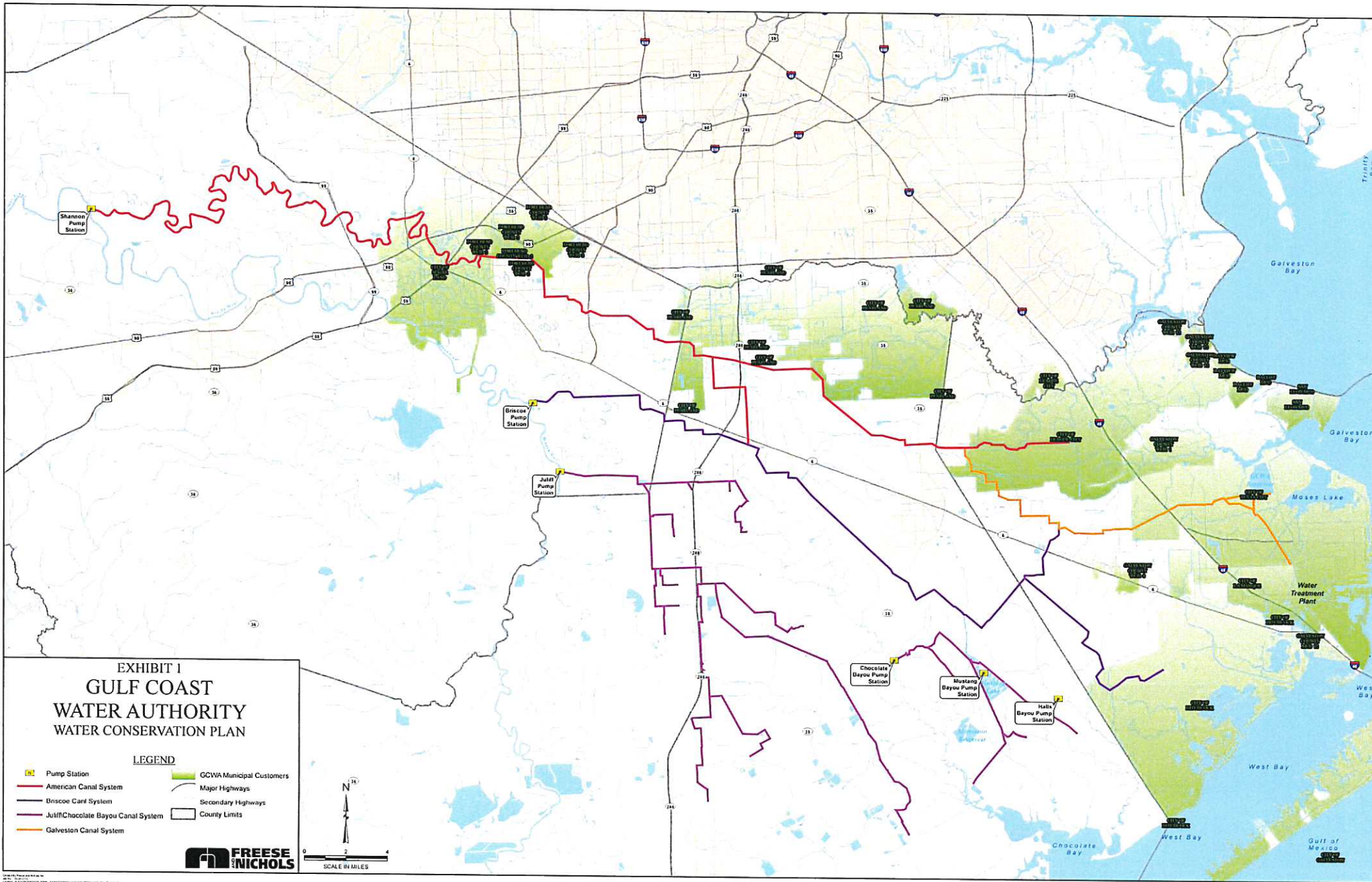
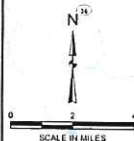


## **Exhibits**

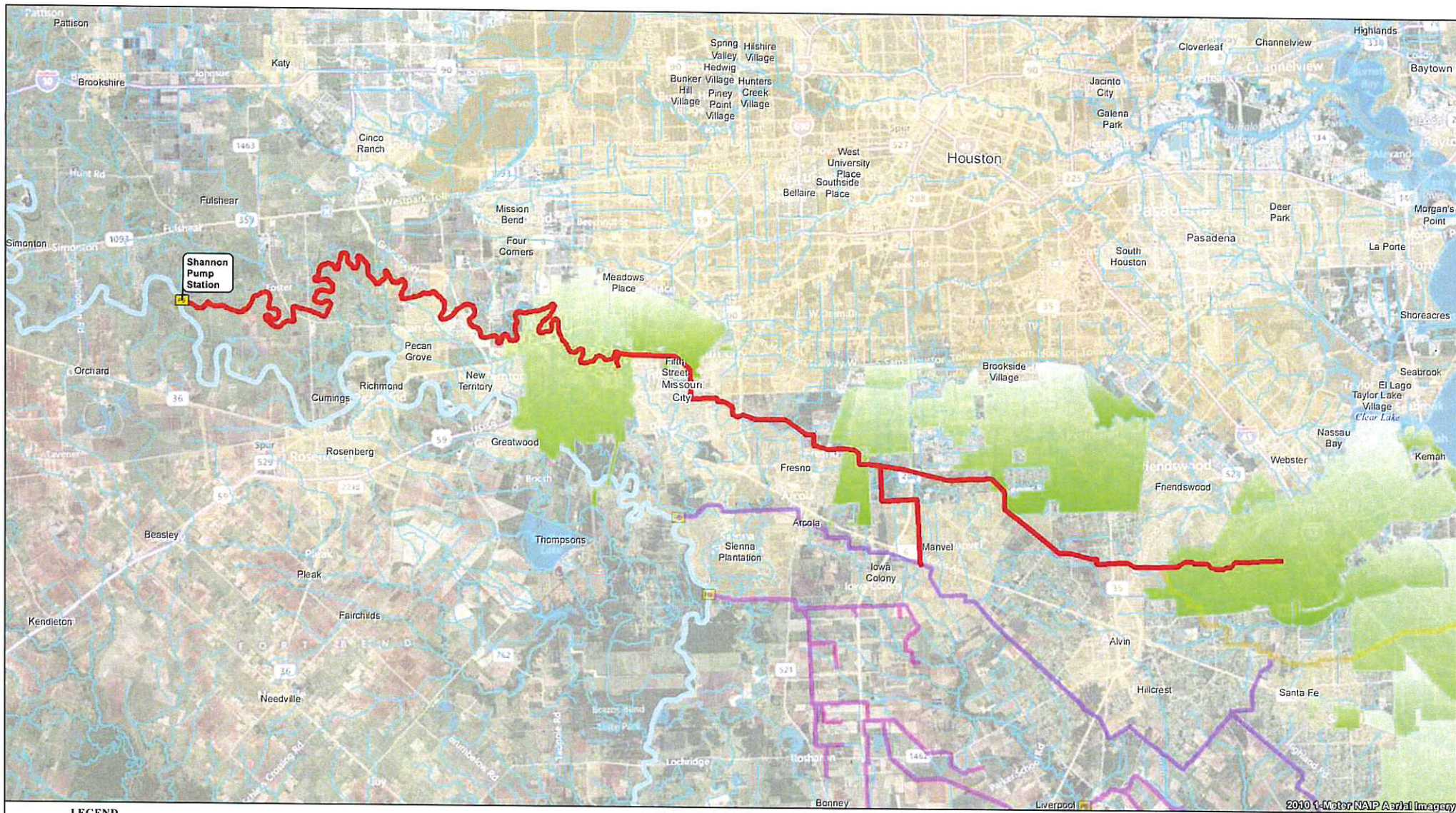
# EXHIBIT I GULF COAST WATER AUTHORITY WATER CONSERVATION PLAN

## LEGEND

-  Pump Station
-  American Canal System
-  Briscoe Canal System
-  Jett/Chocolate Bayou Canal System
-  Galveston Canal System
-  GCWA Municipal Customers
-  Major Highways
-  Secondary Highways
-  County Limits







2010 1-Meter NAIP Aerial Imagery

**LEGEND**

- Pump Station
- GCWA Municipal Customers
- American Canal System
- Briscoe Canal System
- Galveston Canal System
- Juli/Chocolate Bayou Canal System

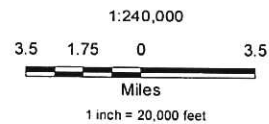
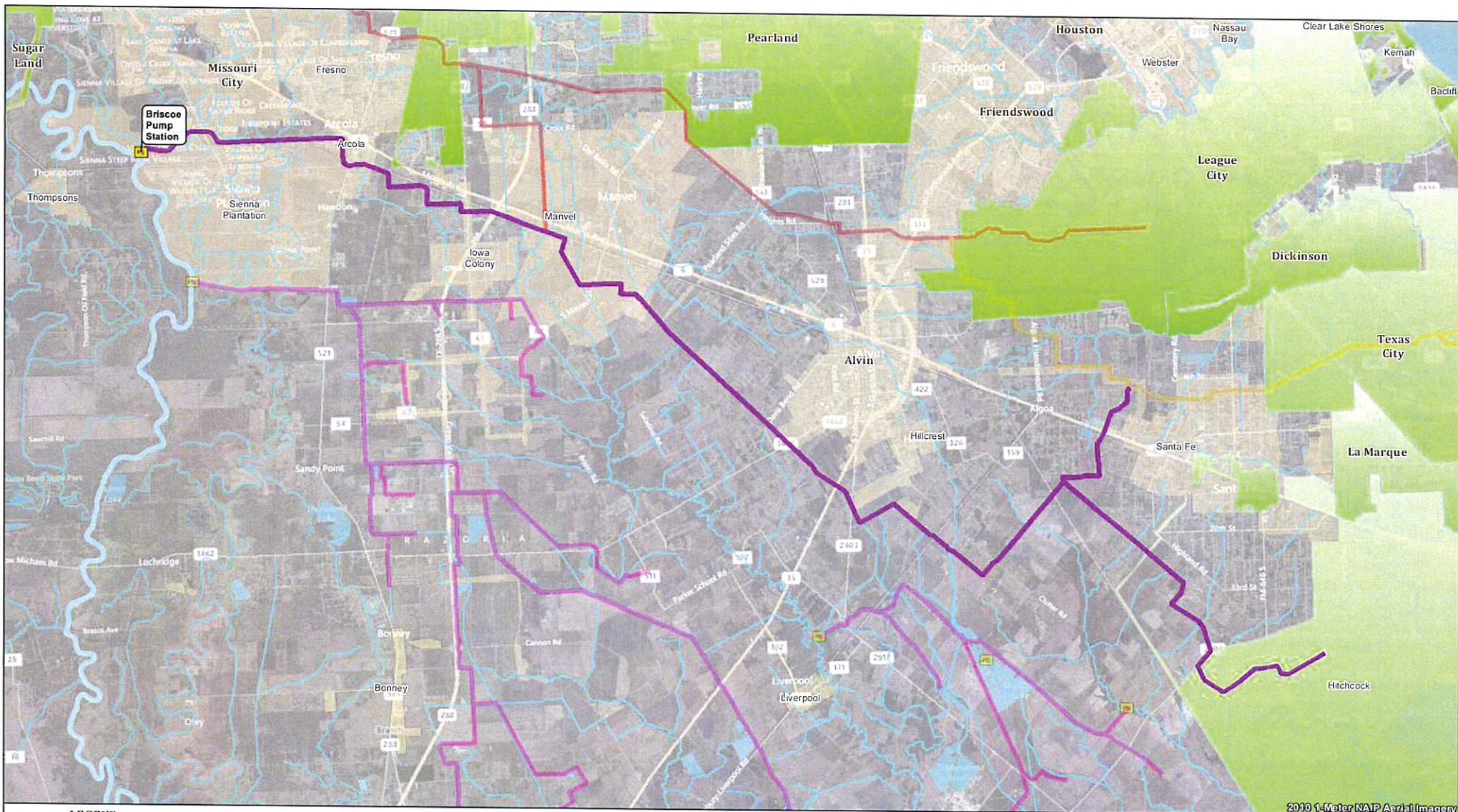


EXHIBIT 2  
AMERICAN CANAL SYSTEM  
**GULF COAST  
WATER AUTHORITY**  
WATER CONSERVATION PLAN





2010 1-Meter NAIP Aerial Imagery

# LEGEND

- Pump Station
- GCWA Municipal Customers
- American Canal System
- Briscoe Canal System
- Galveston Canal System
- Julf/Chocolate Bayou Canal System

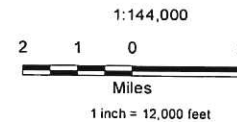
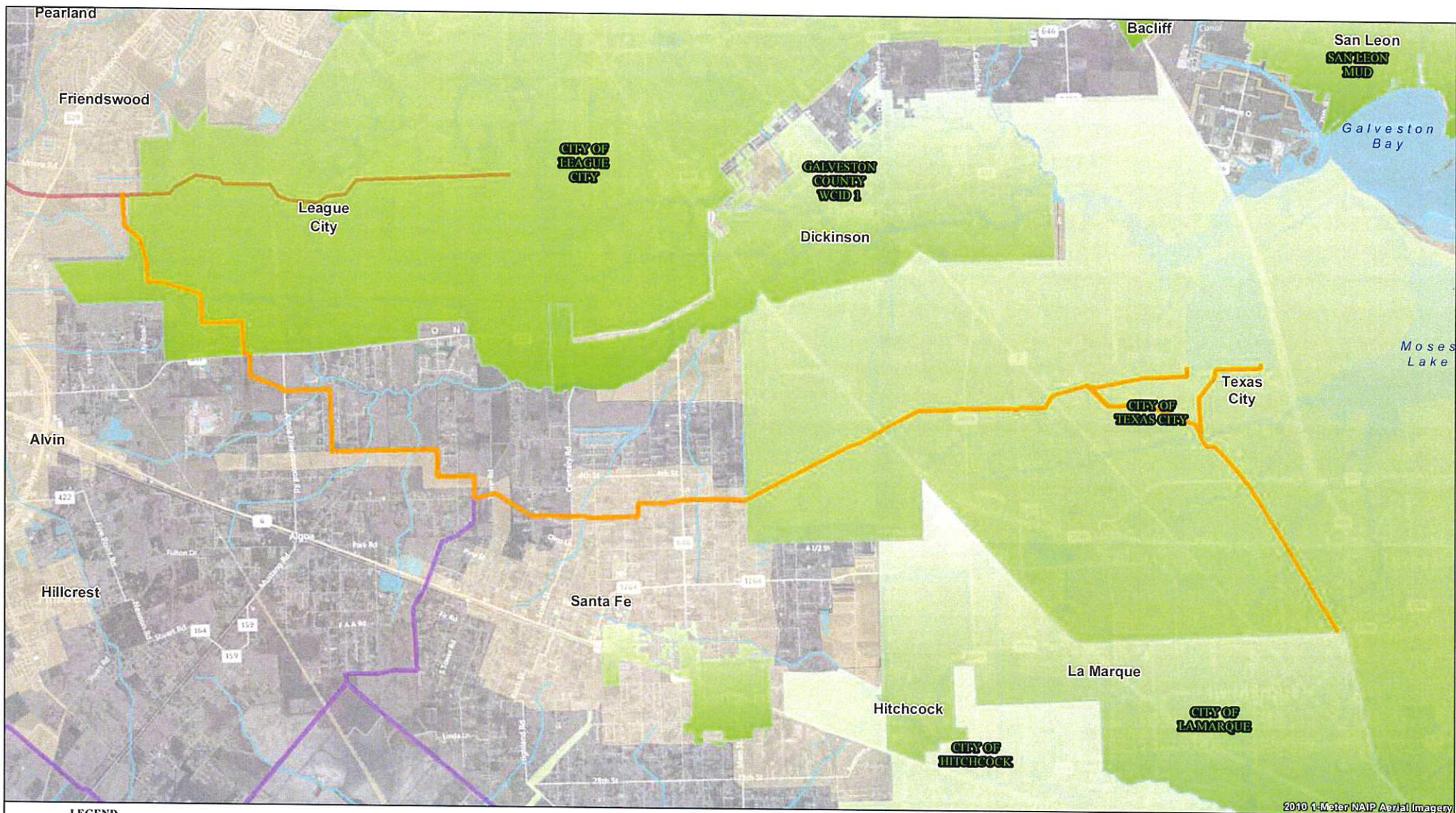








EXHIBIT 3  
BRISCOE CANAL SYSTEM  
GULF COAST  
WATER AUTHORITY  
WATER CONSERVATION PLAN





2010 1-Meter NAIP Aerial Imagery

# **LEGEND**

-  Pump Station
-  GCWA Municipal Customers
-  American Canal System
-  Briscoe Canal System
-  Galveston Canal System
-  Juli Chocolate Bayou Canal System

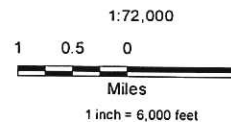
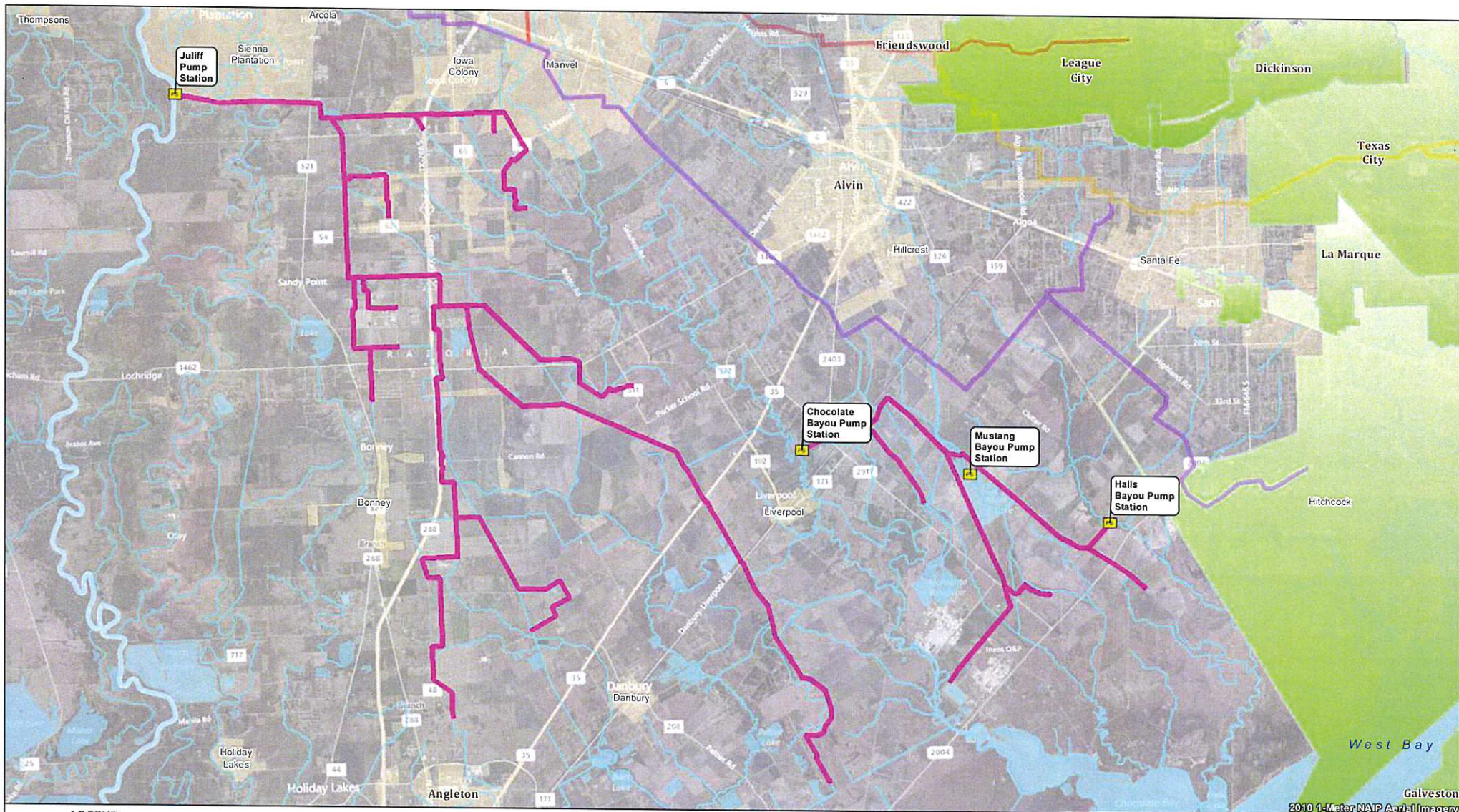








EXHIBIT 4  
GALVESTON CANAL SYSTEM  
GULF COAST  
WATER AUTHORITY  
WATER CONSERVATION PLAN





# **LEGEND**

-  Pump Station
-  GCWA Municipal Customers
-  American Canal System
-  Briscoe Canal System
-  Galveston Canal System
-  Juliff/Chocolate Bayou Canal System

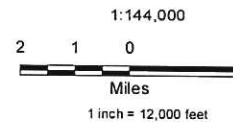


EXHIBIT 5  
JULIFF/CHOCOLATE BAYOU CANAL SYSTEM  
GULF COAST  
WATER AUTHORITY  
WATER CONSERVATION PLAN



**Appendix A**  
**Texas Commission on Environmental Quality Rules on Water**  
**Conservation Plans**

<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b>RULE §288.1</b>	<b>Definitions</b>

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The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

- (1) Agricultural or Agriculture--Any of the following activities:
    - (A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;
    - (B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;
    - (C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;
    - (D) raising or keeping equine animals;
    - (E) wildlife management; and
    - (F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.
  - (2) Agricultural use--Any use or activity involving agriculture, including irrigation.
  - (3) Best management practices--Voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and that can be implemented within a specific time frame.
  - (4) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.
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- (5) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).
  - (6) Industrial use--The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, commercial fish production, and the development of power by means other than hydroelectric, but does not include agricultural use.
  - (7) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water through a municipal distribution system.
  - (8) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.
  - (9) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field repressuring.
  - (10) Municipal per capita water use--The sum total of water diverted into a water supply system for residential, commercial, and public and institutional uses divided by actual population served.
  - (11) Municipal use--The use of potable water within or outside a municipality and its environs whether supplied by a person, privately owned utility, political subdivision, or other entity as well as the use of sewage effluent for certain purposes, including the use of treated water for domestic purposes, fighting fires, sprinkling streets, flushing sewers and drains, watering parks and parkways, and recreational purposes, including public and private swimming pools, the use of potable water in industrial and commercial enterprises supplied by a municipal
-



distribution system without special construction to meet its demands, and for the watering of lawns and family gardens.

- (12) Municipal use in gallons per capita per day--The total average daily amount of water diverted or pumped for treatment for potable use by a public water supply system. The calculation is made by dividing the water diverted or pumped for treatment for potable use by population served. Indirect reuse volumes shall be credited against total diversion volumes for the purpose of calculating gallons per capita per day for targets and goals.
- (13) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.
- (14) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.
- (15) Public water supplier--An individual or entity that supplies water to the public for human consumption.
- (16) Regional water planning group--A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.
- (17) Retail public water supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.
-

- (18) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.
- (19) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).
- (20) Wholesale public water supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

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**Source Note:** The provisions of this §288.1 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146, amended to be effective October 7, 2004, 29 TexReg 9384.

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<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b>RULE §288.2</b>	<b>Water Conservation Plans for Municipal Uses by Public Water Suppliers</b>

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- (a) A water conservation plan for municipal water use by public water suppliers must provide information in response to the following. If the plan does not provide information for each requirement, the public water supplier shall include in the plan an explanation of why the requirement is not applicable.
- (1) Minimum requirements. All water conservation plans for municipal uses by public drinking water suppliers must include the following elements:
- (A) a utility profile including, but not limited to, information regarding population and customer data, water use data, water supply system data, and wastewater system data;
  - (B) until May 1, 2005, specification of conservation goals including, but not limited to, municipal per capita water use goals, the basis for the development of such goals, and a time frame for achieving the specified goals;
  - (C) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for municipal use, in gallons per capita per day. The goals established by a public water supplier under this subparagraph are not enforceable;
  - (D) metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply;
  - (E) a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement;
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- (F) measures to determine and control unaccounted-for uses of water (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections; abandoned services; etc.);
  - (G) a program of continuing public education and information regarding water conservation;
  - (H) a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water;
  - (I) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and
  - (J) a means of implementation and enforcement which shall be evidenced by:
    - (i) a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier; and
    - (ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and
  - (K) documentation of coordination with the regional water planning groups for the service area of the public water supplier in order to ensure consistency with the appropriate approved regional water plans.
- (2) Additional content requirements. Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected population of 5,000 or more within the next ten years subsequent to the effective date of the plan must include the following elements:
- (A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control unaccounted-for uses of water;
  - (B) a record management system to record water pumped, water deliveries, water sales, and water losses which allows for the desegregation of water sales and uses into the following user classes:
    - (i) residential;
    - (ii) commercial;
    - (iii) public and institutional; and
-

- (iv) industrial;
    - (C) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.
  - (3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:
    - (A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;
    - (B) adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;
    - (C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;
    - (D) reuse and/or recycling of wastewater and/or graywater;
    - (E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;
    - (F) a program and/or ordinance(s) for landscape water management;
-

- (G) a method for monitoring the effectiveness and efficiency of the water conservation plan; and
  - (H) any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.
- (b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the Texas Water Development Board.
- (c) Beginning May 1, 2005, a public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group.

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**Source Note:** The provisions of this §288.2 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384

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<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b><u>RULE §288.3</u></b>	<b>Water Conservation Plans for Industrial or Mining Use</b>

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- (a) A water conservation plan for industrial or mining uses of water must provide information in response to each of the following elements. If the plan does not provide information for each requirement, the industrial or mining water user shall include in the plan an explanation of why the requirement is not applicable.
- (1) a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal;
  - (2) until May 1, 2005, specification of conservation goals, the basis for the development of such goals, and a time frame for achieving the specified goals;
  - (3) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by industrial or mining water users under this paragraph are not enforceable;
  - (4) a description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0% to be used in order to measure and account for the amount of water diverted from the source of supply;
  - (5) leak-detection, repair, and accounting for water loss in the water distribution system;
  - (6) application of state-of-the-art equipment and/or process modifications to improve water use efficiency; and
-

- (7) any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) Beginning May 1, 2005, an industrial or mining water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The industrial or mining water user shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group.

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**Source Note:** The provisions of this §288.3 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384

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<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b><u>RULE §288.4</u></b>	<b>Water Conservation Plans for Agricultural Use</b>

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- (a) A water conservation plan for agricultural use of water must provide information in response to the following subsections. If the plan does not provide information for each requirement, the agricultural water user must include in the plan an explanation of why the requirement is not applicable.
- (1) For an individual agricultural user other than irrigation:
- (A) a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal;
  - (B) until May 1, 2005, specification of conservation goals, the basis for the development of such goals, and a time frame for achieving the specified goals;
  - (C) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by agricultural water users under this subparagraph are not enforceable;
  - (D) a description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0% to be used in order to measure and account for the amount of water diverted from the source of supply;
  - (E) leak-detection, repair, and accounting for water loss in the water distribution system;
  - (F) application of state-of-the-art equipment and/or process modifications to improve water use efficiency; and
-



(G) any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(2) For an individual irrigation user:

(A) a description of the irrigation production process which shall include, but is not limited to, the type of crops and acreage of each crop to be irrigated, monthly irrigation diversions, any seasonal or annual crop rotation, and soil types of the land to be irrigated;

(B) a description of the irrigation method or system and equipment including pumps, flow rates, plans, and/or sketches of the system layout;

(C) a description of the device(s) and/or methods within an accuracy of plus or minus 5.0%, to be used in order to measure and account for the amount of water diverted from the source of supply;

(D) until May 1, 2005, specification of conservation goals including, where appropriate, quantitative goals for irrigation water use efficiency and a pollution abatement and prevention plan;

(E) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings including, where appropriate, quantitative goals for irrigation water use efficiency and a pollution abatement and prevention plan. The goals established by an individual irrigation water user under this subparagraph are not enforceable;

(F) water-conserving irrigation equipment and application system or method including, but not limited to, surge irrigation, low pressure sprinkler, drip irrigation, and nonleaking pipe;

(G) leak-detection, repair, and water-loss control;

(H) scheduling the timing and/or measuring the amount of water applied (for example, soil moisture monitoring);

(I) land improvements for retaining or reducing runoff, and increasing the infiltration of rain and irrigation water including, but not limited to, land leveling, furrow diking, terracing, and weed control;

(J) tailwater recovery and reuse; and

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(K) any other water conservation practice, method, or technique which the user shows to be appropriate for preventing waste and achieving conservation.

(3) For a system providing agricultural water to more than one user:

(A) a system inventory for the supplier's:

- (i) structural facilities including the supplier's water storage, conveyance, and delivery structures;
- (ii) management practices, including the supplier's operating rules and regulations, water pricing policy, and a description of practices and/or devices used to account for water deliveries; and
- (iii) a user profile including square miles of the service area, the number of customers taking delivery of water by the system, the types of crops, the types of irrigation systems, the types of drainage systems, and total acreage under irrigation, both historical and projected;

(B) until May 1, 2005, specification of water conservation goals, including maximum allowable losses for the storage and distribution system;

(C) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings including maximum allowable losses for the storage and distribution system. The goals established by a system providing agricultural water to more than one user under this subparagraph are not enforceable;

(D) a description of the practice(s) and/or device(s) which will be utilized to measure and account for the amount of water diverted from the source(s) of supply;

(E) a monitoring and record management program of water deliveries, sales, and losses;

(F) a leak-detection, repair, and water loss control program;

(G) a program to assist customers in the development of on-farm water conservation and pollution prevention plans and/or measures;

(H) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water

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conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;

- (I) official adoption of the water conservation plan and goals, by ordinance, rule, resolution, or tariff, indicating that the plan reflects official policy of the supplier;
- (J) any other water conservation practice, method, or technique which the supplier shows to be appropriate for achieving conservation; and
- (K) documentation of coordination with the regional water planning groups in order to ensure consistency with appropriate approved regional water plans.

(b) A water conservation plan prepared in accordance with the rules of the United States Department of Agriculture Natural Resource Conservation Service, the Texas State Soil and Water Conservation Board, or other federal or state agency and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and that agency.

(c) Beginning May 1, 2005, an agricultural water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. An agricultural water user shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group.

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**Source Note:** The provisions of this §288.4 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384

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<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b>RULE §288.5</b>	<b>Water Conservation Plans for Wholesale Water Suppliers</b>

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A water conservation plan for a wholesale water supplier must provide information in response to each of the following paragraphs. If the plan does not provide information for each requirement, the wholesale water supplier shall include in the plan an explanation of why the requirement is not applicable.

- (1) Minimum requirements. All water conservation plans for wholesale water suppliers must include the following elements:
    - (A) a description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data;
    - (B) until May 1, 2005, specification of conservation goals including, where appropriate, target per capita water use goals for the wholesaler's service area, maximum acceptable unaccounted-for water, the basis for the development of these goals, and a time frame for achieving these goals;
    - (C) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable unaccounted-for water, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable;
    - (D) a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply;
    - (E) a monitoring and record management program for determining water deliveries, sales, and losses;
-

- (F) a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system;
  - (G) a requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;
  - (H) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan;
  - (I) a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan; and
  - (J) documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.
- (2) Additional conservation strategies. Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of paragraph (1) of this section, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:
-

- (A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;
  - (B) a program to assist agricultural customers in the development of conservation pollution prevention and abatement plans;
  - (C) a program for reuse and/or recycling of wastewater and/or graywater; and
  - (D) any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.
- (3) Review and update requirements. Beginning May 1, 2005, the wholesale water supplier shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. A wholesale water supplier shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group.

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**Source Note:** The provisions of this §288.5 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384

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**Appendix B**  
**Utility Profile & Water Conservation Plan Requirements for Wholesale  
Public Water Suppliers (TCEQ-20162)**



## Texas Commission on Environmental Quality

### PROFILE & WATER CONSERVATION PLAN REQUIREMENTS FOR WHOLESALE PUBLIC WATER SUPPLIERS

This form is provided to assist wholesale public water suppliers in water conservation plan development. Information from this form should be included within a wholesale public water supplier water conservation plan. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Supply Division at (512) 239-4691.

**Name of Entity:** Gulf Coast Water Authority

**Address & Zip:** 3630 Highway 1765 Texas City, Texas 77591

**Telephone Number:** (409) 935-2438

**Form Completed by:** James Vanderwater

**Title:** Engineer

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Name and Phone Number of Person/Department responsible for implementing a water conservation program:** \_\_\_\_\_

## PROFILE

### I. WHOLESALE SERVICE AREA POPULATION AND CUSTOMER DATA

#### A. Population and Service Area Data

1. Service area size in square miles: 481.8 sq. mi.  
(attach a copy of service-area map)
2. Current population of service area: 245,210\*  
\*2011 population does not include raw water customers
3. Current population served for:
  - a. water 245,210
  - b. wastewater 0

4. Population served for previous five years:

<u>Year</u>	<u>Population</u>
<u>2007</u>	<u>231,034</u>
<u>2008</u>	<u>234,215</u>
<u>2009</u>	<u>237,396</u>
<u>2010</u>	<u>240,578</u>
<u>2011</u>	<u>245,210</u>

5. Projected population for service area in the following decades:

<u>Year</u>	<u>Population</u>
<u>2010</u>	<u>240,578</u>
<u>2020</u>	<u>458,880</u>
<u>2030</u>	<u>630,968</u>
<u>2040</u>	<u>674,740</u>
<u>2050</u>	<u>699,441</u>

6. List source or method for the calculation of current and projected population:

Population projections were developed from a combination of customer survey results from wholesale customers as well as planning level data developed as part of a study by Harris Galveston Subsidence District to be used in the development of the 2016 Region H Regional Water Plan.

## B. Customer Data

List (or attach) the names of all wholesale customers, amount of annual contract, and amount of the annual use for each for the previous year:

<b>Wholesale Customer</b>	<b>Contracted Amount (ac-ft)</b>	<b>Previous Year Amount of Water Delivered (ac-ft)</b>
City of Missouri City	16,800	0
City of Pearland	22,400 (11,200+11,200)	0
City of Sugar Land	22,400	0
FB WCID #2 (Stafford)	11,760	0
Pecan Grove MUD	3,101	0
Bacliff MUD	2,003	683
Bayview MUD	719	144
City of Galveston	31,474	17,590
City of Texas City	22,098	6,948
GC FWSD #6 (Tiki Island)	1,045 (629+416)	254
GC WCID #1 (Dickinson, Texas City)	3,867	2,555
GC WCID #12 (Kemah, Clear Lake Shore)	3,317 (1,487+1,830)	893
San Leon MUD	3,319	644
City of Hitchcock	1,730	864
City of La Marque	3,207	2,492
City of League City	2,307	2,012
GC MUD #12 (Bayou Vista)	520	313
GC WCID #8 (Santa Fe)	1,154	610
NRG Texas LP	2,166	15



## II. WATER USE DATA FOR SERVICE AREA

### A. Water Delivery

Indicate if the water provided under wholesale contracts is treated or raw water and the annual amount for each for previous year:

	Total amount delivered or sold for previous year (acre-feet)
Treated	<u>36,015</u>
Raw	<u>0</u>

### B. Water Accounting Data

1. Total amount of water diverted at point of diversion(s) for previous five years (in acre-feet) for all water uses: The following table reflects the discharge of the TMWTP in acre-feet and does not account for raw water diversions.

Year	2011	2010	2009	2008	2007
January	2,341	2,609	2,122	2,834	2,634
February	3,190	2,462	2,242	2,527	2,543
March	2,634	2,838	2,532	3,040	3,021
April	2,797	2,893	2,484	3,081	2,640
May	3,195	1,651	3,181	3,077	3,121
June	3,197	1,559	3,630	3,649	3,381
July	3,371	2,024	3,644	3,657	2,864
August	3,476	3,273	3,769	3,624	3,106
September	3,095	2,911	3,348	2,680	3,100
October	3,119	2,985	3,214	2,912	2,974
November	2,781	2,608	2,798	2,175	2,661
December	2,819	2,887	3,077	2,604	2,816
TOTAL	36,015	30,700	36,041	35,860	34,861

2. Wholesale population served and total amount of water diverted for **municipal use** for previous five years:

Year	Total Population Served	Total Annual Water Diverted for Municipal Use (ac-ft)
2007	231,034	34,861
2008	234,215	35,860
2009	237,396	36,041
2010	240,578	30,700
2011	245,210	36,015

### C. Projected Water Demands

If applicable, project and attach water supply demands for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirement from such growth.

Population projections through 2070 for GCWA customers are provided in Section 2.3 of the Water Conservation Plan.

## III. WATER SUPPLY SYSTEM DATA

### A. Water Supply Sources

List all current water supply sources and the amounts authorized with each:

COA Number	Priority Year	Description	System	Use Code	Permitted Diversion (Ac-Ft/Yr)
5168	1926	Brazos River diversion	ABG	1,2,3	99,932
	1947	7,308 Ac-Ft storage		13	
	1999	65 Ac-Ft storage		2	
5169	1948	Jones/Oyster Creek diversion 8925.48 Ac-Ft storage	ABG	1,2,3,7	12,000
5171	1939	Brazos River diversion	ABG	1,2,4	75,000
	1950			3	50,000
5322	1929	Juliff Plant 864 Ac-Ft storage for pumping	Chocolate Bayou	1,2,3	155,000
5357	1937	Choc. Bayou, Mustang Bayou, Halls Bayou	Chocolate Bayou	1,3,7	57,500
	1976	8,951 Ac-Ft storage		2	
TOTAL					449,432

Use Codes:

1 – Municipal/Domestic  
2 – Industrial  
3 – Irrigation

4 – Mining  
5 – Hydroelectric  
6 – Navigation  
7 – Recreation

8 – Other  
9 – Recharge  
11 – Domestic and Livestock  
13 – Storage

### B. Treatment and Distribution System (if provide treated water)

- Design daily capacity of system: 50 MGD
- Storage Capacity: Elevated 0 MGD, Ground 9 MGD
- Please describe the water system and attach. Include the number of

treatment plants, wells, and storage tanks. If possible, attach a sketch of the system layout.

The Thomas S. Mackey Water Treatment Plant (TMWTP) is a conventional surface water treatment plant with a nominal capacity of 50 MGD. Brazos River water is pumped by the Shannon Plant (pump station) and the Briscoe Plant (pump station) and flows through the GCWA canal system. Water not used by irrigation and industrial customers flows into the GCWA reservoir system in Texas City, Texas.

#### **IV. WASTEWATER SYSTEM DATA (N/A)**

##### **A. Wastewater System Data (not applicable)**

GCWA does not operate a wastewater system.



## **REQUIREMENTS FOR WATER CONSERVATION PLANS FOR WHOLESALE PUBLIC WATER SUPPLIERS**

In addition to the description of the wholesaler's service area (profile from above), a water conservation plan for a wholesale public water supplier must include, at a minimum, additional information as required by Title 30, Texas Administrative Code, §288.5. Note: If the water conservation plan does not provide information for each requirement, an explanation must be included as to why the requirement is not applicable.

### **Specific, Quantified 5 & 10-Year Targets**

The water conservation plan must include specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable unaccounted-for water, and the basis for the development of these goals. Note that the goals established by wholesale water suppliers under this subparagraph are not enforceable.

### **Metering Devices**

The water conservation plan must include a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply.

### **Record Management Program**

The water conservation plan must include a monitoring and record management program for determining water deliveries, sales, and losses.

### **Metering/Leak-Detection and Repair Program**

The water conservation plan must include a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system.

### **Reservoir Systems Operations Plan**

The water conservation plan must include a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan.

### **Contract Requirements for Successive Customer Conservation**

The water conservation plan must include a requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of Title 30 TAC Chapter 288.

### **Enforcement Procedure & Official Adoption**

The water conservation plan must include a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan.

### **Coordination with the Regional Water Planning Group(s)**

The water conservation plan must include documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

Example statement to be included within the water conservation plan:

*The service area of the Gulf Coast Water Authority is located within Region H and the Gulf Coast Water Authority has provided a copy of this water conservation plan to the Region H Regional Water Planning Group.*

### **Plan Review and Update**

Beginning May 1, 2005, the wholesale water supplier shall review and update its water conservation plan, as appropriate based on an assessment of previous five-year and ten-year targets and any other new or updated information. A wholesale water supplier shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. The revised plan must also include an implementation report.

### ***Best Management Practices Guide***

*On November 2004, the Texas Water Development Board's (TWDB) Report 362 was completed by the Water Conservation Implementation Task Force. Report 362 is the Water Conservation Best Management Practices (BMP) Guide. The BMP Guide is a voluntary list of management practices that water users may implement in addition to the required components of Title 30, Texas Administrative Code, Chapter 288. The BMP Guide is available on the TWDB's website at the link below or by calling (512) 463-7847.*

<http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf>

**If you have any questions on how to fill out this form or about the Wholesale Public Water Suppliers program, please contact us at 512/239-4691.**

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512-239-3282.



## Appendix A

### Definitions of Commonly Used Terms

**Conservation** ■ Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

**Industrial use** ■ The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, commercial fish production, and the development of power by means other than hydroelectric, but does not include agricultural use.

**Irrigation** ■ The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water through a municipal distribution system.

**Municipal per capita water use** ■ The sum total of water diverted into a water supply system for residential, commercial, and public and institutional uses divided by actual population served.

**Municipal use** ■ The use of potable water within or outside a municipality and its environs whether supplied by a person, privately owned utility, political subdivision, or other entity as well as the use of sewage effluent for certain purposes, including the use of treated water for domestic purposes, fighting fires, sprinkling streets, flushing sewers and drains, watering parks and parkways, and recreational purposes, including public and private swimming pools, the use of potable water in industrial and commercial enterprises supplied by a municipal distribution system without special construction to meet its demands, and for the watering of lawns and family gardens.

**Municipal use in gallons per capita per day** ■ The total average daily amount of water diverted or pumped for treatment for potable use by a public water supply system. The calculation is made by dividing the water diverted or pumped for treatment for potable use by population served. Indirect reuse volumes shall be credited against total diversion volumes for the purpose of calculating gallons per capita per day for targets and goals.

**Public water supplier** ■ An individual or entity that supplies water to the public for human consumption.

**Regional water planning group** ■ A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.

**Retail public water supplier** ■ An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that

supplies water to itself or its employees or tenants when that water is not resold to or used by others.

**Reuse** ■ The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

**Water conservation plan** ■ A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

**Water loss** - The difference between water diverted or treated and water delivered (sold). Water loss can result from:

1. inaccurate or incomplete record keeping;
2. meter error;
3. unmetered uses such as firefighting, line flushing, and water for public buildings and water treatment plants;
4. leaks; and
5. water theft and unauthorized use.

**Wholesale public water supplier** ■ An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

**Appendix C**  
**Utility Profile & Water Conservation Plan Requirements for**  
**Industrial/Mining Water Conservation Plan (TCEQ-10213)**





## Texas Commission on Environmental Quality

### INDUSTRIAL/MINING WATER CONSERVATION PLAN

This form is provided to assist entities in conservation plan development for industrial/mining water use. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Supply Division at (512) 239-4691.

**Name:** Gulf Coast Water Authority

**Address:** 3630 Highway 1765 Texas City, Texas 77591

**Telephone Number:** ( 409 ) 935-2438

**Form Completed by:** James Vanderwater

**Title:** Engineer

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.

#### I. BACKGROUND DATA

##### A. Water use

1. Annual diversion appropriated or requested (in acre-feet): In 2011, 97,581.7 ac-ft was diverted for industrial purposes. There are contracts with industrial customers for up to 97,910.3 ac-ft.
2. Maximum diversion rate (cfs): per Certificate of Adjudication (COA)

COA Number	Diversion Rate (cfs)
5168	685.0
5169	253.3
5171	600.0
5322	900.0
5357	201.0

- ##### B. Water sources
- GCWA pumps water from the Brazos River and Chocolate, Halls, and Mustang Bayous.

1. Please indicate the maximum or average annual amounts of water currently used and anticipated to be used (in acre-feet) for industrial/mining purposes:

The following table illustrates the Current Industrial demand, aggregated by Canal System

Canal System	Current (2011) Industrial Water Demand in Acre-Feet for Year				
	2007	2008	2009	2010	2011
American Canal	297.4	503.1	590.7	576.9	1,057.1
Briscoe Canal	14,058.8	13,133.0	9,511.4	9,735.3	9,294.3
Galveston Canal	63,694.3	63,013.7	66,236.2	65,802.7	71,675.3
Juliff and Chocolate Bayou Canals	12,131	12,131	12,131	12,131	15,555

The following table shows the Anticipated Industrial demand, aggregated by Canal System

Canal System	Anticipated Industrial Water Demand in Acre-Feet for Year				
	2012	2013	2014	2015	2016
American Canal	1,057.1	1,057.1	1,057.1	1,057.1	1,057.1
Briscoe Canal	9,294.3	9,294.3	9,294.3	9,294.3	9,294.3
Galveston Canal	71,675.3	71,675.3	71,675.3	71,675.3	71,675.3
Juliff and Chocolate Bayou Canals	15,555	15,555	15,555	15,555	15,555

The following table shows the Certificate of Adjudication (COA) Numbers that GCWA uses, and for which purpose(s) for which they are used.

COA Number	Priority Year	Description	System	Use Code	Permitted Diversion (Ac-Ft/Yr)
5168	1926	Brazos River diversion	ABG	1,2,3	99,932
	1947	7,308 Ac-Ft storage		13	
	1999	65 Ac-Ft storage		2	
5169	1948	Jones/Oyster Creek diversion 8925.48 Ac-Ft storage	ABG	1,2,3,7	12,000
5171	1939	Brazos River diversion	ABG	1,2,4	75,000
	1950			3	50,000
5322	1929	Juliff Plant 864 Ac-Ft storage for pumping	Chocolate Bayou	1,2,3	155,000
5357	1937	Choc. Bayou, Mustang Bayou, Halls Bayou	Chocolate Bayou	1,3,7	57,500
	1976	8,951 Ac-Ft storage		2	
TOTAL					449,432

Use Codes:

1 – Municipal/Domestic  
2 – Industrial  
3 – Irrigation

4 – Mining  
5 – Hydroelectric  
6 – Navigation  
7 – Recreation

8 – Other  
9 – Recharge  
11 – Domestic and Livestock  
13 – Storage

2. How was the surface water data provided above (B1) obtained?

The current Industrial Demand was metered. The anticipated Industrial demand is the projected to be the same as the current demand.

The surface water data in B1 is the total amount available to GCWA for all purposes.

Supplier(s): Brazos River Certificates of Adjudication

3. Was purchased water raw X or treated \_\_\_\_\_?

Purchased raw water is ordered from BRA and is released from upstream reservoirs. It is then pumped from the Brazos River and is conveyed through the GCWA canal system.

4. How was the groundwater data provided above (B1) obtained?

N/A



5. What is the rate and cost of purchased water?

\$64.50 per acre-foot

C. Industrial/Mining Information

1. Major product or service produced by applicant:

Chemical intermediates, Brine Production, Chemical Manufacturing, and Petroleum Refining<sup>1</sup>

2. Major Standard Industrial Classification Code (SIC):

2869, 1479, 2869, and 2911<sup>1</sup>

North American Industry Classification System (NAICS):

325199, 212393, 325199, and 32411<sup>1</sup>

3. Total number of employees at facilities: 1297<sup>1</sup>

## II. WATER USE AND CONSERVATION PRACTICES

As a wholesale water provider, GCWA has no direct knowledge of how customers use their own purchased water. The following table describing water use in industrial processes was generated from the aggregation of the survey responses.

A. Water Use in Industrial or Mining Process<sup>1</sup>:

Production Use	% Groundwater	% Surface Water	% Saline Water	% Treated Water	Water Use (In Acre-Feet)
Cooling, condensing, & refrigeration	0%	8%	0%	0%	568
Processing, washing, transport	0%	1%	0%	0%	82.5
Boiler feed	0%	5%	0%	0%	5388

<sup>1</sup> \*Note: Based on a survey of GCWA industrial customers in which only a subset responded, a generalized cross section of the customer base is presented in this section.

Production Use	% Groundwater	% Surface Water	% Saline Water	% Treated Water	Water Use (In Acre-Feet)
Incorporated into product	0%	7%	0%	0%	1010
Other	15%	7%	0%	0%	499.5

Facility Use	% Groundwater	% Surface Water	% Saline Water	% Treated Water	Water Use (In Acre-Feet)
Cooling tower(s)	13%	70%	0%	0%	8371
Pond(s)	0%	0%	0%	0%	0
Once through	0%	1%	0%	0%	100.5
Sanitary & drinking water	72%	0%	0%	100%	248.5
Irrigation & dust control	0%	0%	0%	0%	0

1. Was fresh water recirculated at this facility?<sup>2</sup>

No respondents indicated that they recirculate water within their facilities.

2. Was electric power generated at this facility (for in-plant use or for sale)?<sup>2</sup>

One respondent indicated that electric power is generated at their facility but failed to identify if that use was for in-plant operations or for sale.

3. Description of the above use(s) of water (e.g., if water is being used for cooling, indicate the cooling system: tower, pond, etc.):

Unknown

4. Describe or illustrate how surface water is diverted and delivered to the point(s) of use, the location of the diversion(s) and points of use, and how diversions are measured:

Surface water is delivered by canal or pipeline to a customer's take point. Some

<sup>2</sup> \*Note: Based on a survey of GCWA industrial customers in which only a subset responded, a generalized cross section of the customer base is presented in this section.

canal customers pump from the canals whereas others have diversions built on the canals. For customers that pump water from the canals, customer meters are typical. For customers that divert water from the canals, screw gates are typical. Pipeline customers are provided water through the Industrial Pumping Station (IPS). The discharge of the station has a 42" and 36" line, each equipped with flow meters that record delivered water. The customers are located within three miles of the IPS and water is delivered through the two lines to each.

5. Monthly water demand for previous year (in acre-feet):

The following table is an aggregate for the total industrial demand for the system in Brazoria, Fort Bend, and Galveston Counties.

	<b>River Diversion**</b>	<b>Percent of Return Flow</b>	<b>Monthly Demand</b>
<b>January</b>	6,879.94	N/A	5,847.95
<b>February</b>	6,881.18	N/A	5,849.00
<b>March</b>	8,101.18	N/A	6,886.00
<b>April</b>	7,841.73	N/A	6,665.47
<b>May</b>	8,122.24	N/A	6,903.90
<b>June</b>	8,684.40	N/A	7,381.74
<b>July</b>	8,712.08	N/A	7,405.27
<b>August</b>	9,211.46	N/A	7,829.74
<b>September</b>	8,393.76	N/A	7,134.70
<b>October</b>	7,459.02	N/A	6,340.17
<b>November</b>	8,028.53	N/A	6,824.25
<b>December</b>	8,186.39	N/A	6,958.43
<b>TOTAL</b>	96,501.91	N/A	82,026.62

\*\*Diversion is based on the monthly demand plus a 15% assumed canal loss.



6. Projected monthly water demand for next year (in acre-feet):

	River Diversion***	Percent of Return Flow	Monthly Demand
January	6,879.94	N/A	5,847.95
February	6,881.18	N/A	5,849.00
March	8,101.18	N/A	6,886.00
April	7,841.73	N/A	6,665.47
May	8,122.24	N/A	6,903.90
June	8,684.40	N/A	7,381.74
July	8,712.08	N/A	7,405.27
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December	8,186.39	N/A	6,958.43
<b>TOTAL</b>	<b>96,501.91</b>	<b>N/A</b>	<b>82,026.62</b>

\*\*\*Diversion is based on the monthly demand with a 15% assumed canal loss.

B. Specific and Quantified Conservation Goal

Water conservation goals for the industrial and mining sector are generally established either for (1) the amount of water recycled, (2) the amount of water reused, or (3) the amount of water not lost or consumed, and therefore is available for return flow.

1. Water conservation goal (water use efficiency measure):

Type of goal to be used:

- ☒ Percent of water reused  
☒ Percent of water not consumed, and therefore returned as flow  
☐ Other (specify)

2. Provide the specific and quantified five-year and ten-year targets for water savings and the basis for development of such goals for this water use/facility:

Most customers are not actively pursuing water conservation, but as new water resources become increasingly scarce, some respondents to the survey have indicated that they are taking measures to increase the probability of their continued access to water resources. This is achieved by reducing the amount of water used as well as increasing the amount of water recycled in-plant. A typical goal for water reduction is approximately 5-10% of current use in 5 years, and 10-15% of current use in 10 years. A typical goal for water recycling is 2-5% of current use in 5 years and 5-8% of current use in 10 years. Customers are

uncertain of exact amounts due to unknown future technological, and/or process upgrades. Customers are also uncertain of future demands from their product customers.

3. Describe the methods and/or device within an accuracy of plus or minus 5% used to measure and account for the amount of water diverted from the source of supply:

Water diverted from the canal system via the Industrial Pumping Station is routed through a 36" and a 42" line to GCWA's industrial customers. Each of these lines is equipped with a Venturi meter. The pressure drop through each meter is measured with a Rosemont Pressure Transducer and flow is derived from the measured drop. These rates are collected and recorded by the GCWA SCADA system. Customers use a diverse mixture of differential pressure orifice meters, turbine meters, mag meters, flow loop meters, and other, unspecified methods of measuring diverted water.

4. Leak-detection, repair, and water-loss accounting measures used:

Most customers indicated that leak detection is done primarily through visual inspection of the delivery systems and plant. Customers with highly accurate measurement devices typically have water accounting systems based on the readings of the meters.

5. Equipment and/or process modifications used to improve water use efficiency:

Most equipment and process modifications are not yet implemented in the plants of many customers. For some customers with operations involving cooling towers, advanced condensate recovery techniques are in the preliminary phase of implementation.

6. Other conservation techniques used:

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### III. WASTEWATER USE CHARACTERISTICS

A. Check the type(s) of wastewater disposal system(s) used at this facility:

On-site wastewater plant

Septic tank(s)

Injection well(s)

City or regional wastewater system

x Other (Please identify) GCWA does not operate a Wastewater treatment plant, but some customers may have their own on-site.

B. What quantity of fresh water was consumed, and therefore not returned to a wastewater treatment system (public or private), or to a water course (including loss to product, evaporation, injection, etc.)?

The quantity of water consumed is unknown due to GCWA's relationships with customers.

### IV. ADDITIONAL COMMENTS/INFORMATION

Please provide any additional information that may indicate the present and future water needs at this facility, and any water problems.

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#### ***Best Management Practices Guide***

*On November 2004, the Texas Water Development Board's (TWDB) Report 362 was completed by the Water Conservation Implementation Task Force. Report 362 is the Water Conservation Best Management Practices (BMP) Guide. The BMP Guide is a voluntary list of management practices that water users may implement in addition to the required components of Title 30, Texas Administrative Code, Chapter 288. The BMP Guide is available on the TWDB's website at the link below or by calling (512) 463-7847.*

<http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf>

**If you have any questions on how to fill out this form or about the Industrial/Mining Water Conservation program, please contact us at 512/239-4691.**

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512-239-3282.



**Appendix D**  
**System Inventory and Water Conservation Plan Requirements for**  
**Agricultural Water Suppliers Providing Water to More than One User**  
**(TCEQ-10244)**



## Texas Commission on Environmental Quality

### SYSTEM INVENTORY AND WATER CONSERVATION PLAN FOR AGRICULTURAL WATER SUPPLIERS PROVIDING WATER TO MORE THAN ONE USER

This form is provided to assist entities in conservation plan development for agricultural water suppliers providing water to more than one user individually-operated irrigation systems. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Supply Division at (512) 239-4691.

**Name:** Gulf Coast Water Authority

**Address:** 3630 Highway 1765 Texas City, Texas 77591

**Telephone Number:** (409) 935-2438

**Form Completed By:** James Vanderwater **Title:** Engineer

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**NOTE:** If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.

#### I. STRUCTURAL FACILITIES

A. Description of service area: The service area of GCWA for agricultural customers includes portions of Brazoria, Fort Bend, and Galveston Counties. The majority of agricultural customers are currently in Brazoria and Fort Bend Counties.

B. Total miles of main canals and pipelines: 400 miles

C. Total miles of lateral canals and pipelines: 100 miles

D. Reservoir capacity, if applicable: 864 ac-ft in three reservoirs on the Juliff and Chocolate Bayou Canal Systems.

E. Description of pumps and pumping stations: The Shannon Plant (American Canal) is located near Fulshear on the Brazos River and discharges into the American System Canal. Two of the pumps at the Shannon Plant are rated for 50,000 GPM and one is rated for 41,000

GPM.

The Second Lift station (American Canal) is located in Sugar Land and consists of three pumps. Two of the pumps are rated for 42,000 GPM and one is rated for 40,000 GPM. The purpose of the Second Lift is to move water along the American Canal system as well as the permitted impoundment of Jones and Oyster Creeks.

The Briscoe Plant (Briscoe Canal) is located near Missouri City and has three 70,000 GPM pumps that divert water from the Brazos River into the Briscoe Canal system.

The Chocolate Bayou Canal System has four different pump stations: the Juliff Pump Station, Chocolate Bayou Pump Station, Mustang Bayou Pump Station, and Halls Bayou Pump Station. The Juliff Pump Station is located near Sandy Point and has three 70,000 GPM pumps, two 38,000 GPM pumps, and one 45,000 GPM pump that divert water from the Brazos River into the Juliff Canal. The Chocolate Bayou Pump Station in Brazoria County has one 33,000 GPM pump, two 14,000 GPM pumps, and one 12,000 GPM pump that divert water from Chocolate Bayou into the Chocolate Bayou Canal System. The Mustang Bayou Pump Station in Brazoria County has one 5,000 GPM pump, one 8,000 GPM pump, and one 10,000 GPM pump. The Halls Bayou Pump Station in Brazoria County has one 15,000 GPM pump and one 6,000 GPM pump.

F. Description of meters and/or measuring devices: A Parshall Flume is used to measure the flow from the Shannon Plant approximately two miles downstream from the diversion point. Water pumped at the Second Lift and Briscoe Plant stations is also metered.

G. Description of customer gates and measuring devices: All agricultural customers have gravity flow controlled by screw gates and volume is estimated based on the number of acres irrigated and Texas Agriculture Extension Service data for the amount of water required for each crop.

Some golf course customers pump water directly out of the American Canal system. That water is measured by flow meters installed in the pumping system.



H. Description of canal construction:

- a. Miles of unlined canals: 500 miles
- b. Miles of lined canals: 0 miles
- c. Miles of enclosed pipelines: 0 miles
- d. Other: Approximately 42 miles of the American Canal system are from the Jones and Oyster Creek natural streambed. The American Canal system extends from the Shannon Plant to the end of the American system in League City. The Briscoe Canal system extends from the Briscoe Plant to Santa Fe and is entirely man-made. The Galveston Canal system connects the American and Briscoe systems and routes flow to the GCWA Reservoir. The Lateral 10 Canal allows flow from the American Canal to the Briscoe Canal near Manvel. The Juliff system draws water from the Brazos River about 7 miles Northwest of Rosharon. The Chocolate Bayou Canal System generally extends east from Chocolate Bayou to Halls Bayou near the Brazoria and Galveston County line.

I. Description of canal conditions and recent or planned improvements:

The canal system is generally in good condition and is maintained regularly as required for system reliability. Regular maintenance includes vegetation control, silt removal, levee rehabilitation, and canal crossings.

J. Description of any other structural facilities not covered above:

There are numerous canal crossing and flow control structures that are continually monitored and maintained for system function.

## II. MANAGEMENT PRACTICES

A. Total water available to district (in acre-feet/year): 482,100 ac-ft

COA Number	Priority Year	Description	System	Use Code	Permitted Diversion (Ac-Ft/Yr)
5168	1926	Brazos River diversion	ABG	1,2,3	99,932
	1947	7,308 Ac-Ft storage		13	
	1999	65 Ac-Ft storage		2	
5169	1948	Jones/Oyster Creek diversion 8925.48 Ac-Ft storage	ABG	1,2,3,7	12,000
5171	1939	Brazos River diversion	ABG	1,2,4	75,000
	1950			3	50,000
5322	1929	Juliff Plant 864 Ac-Ft storage for pumping	Chocolate Bayou	1,2,3	155,000
5357	1937	Choc. Bayou, Mustang Bayou, Halls Bayou	Chocolate Bayou	1,3,7	57,500
	1976	8,951 Ac-Ft storage		2	
TOTAL					449,432

Use Codes:

1 – Municipal/Domestic  
2 – Industrial  
3 – Irrigation

4 – Mining  
5 – Hydroelectric  
6 – Navigation  
7 – Recreation

8 – Other  
9 – Recharge  
11 – Domestic and Livestock  
13 – Storage

1. Maximum water rights allocation to district: 449,432 ac-ft
  - a. Water rights (COA) number(s): 5168, 5169, 5171, 5322, 5357
  - b. Other water contracted to be delivered by district: Purchased water from BRA under two separate contracts: 23,333 ac-ft/yr, and 9,335 ac-ft/yr
2. Average annual water diverted by district (in acre-feet/year): 187,091
3. Average annual water delivered to customers (in a-f/yr.): 162,687
4. Delivery efficiency (percentage): 87%
5. Historical diversions and deliveries:

Year	Annual Rainfall (in./yr.)	Total Annual Water Diverted (acre-feet)	Annual Irrigation Water Delivered (acre-feet)	Annual Municipal Water Delivered (acre-feet)	Annual Other Water Delivered (acre-feet)	Total Annual Water Delivered (acre-feet)	Estimated Delivery Efficiency (percentage)
2009	37.16	179,895	44,050	36,041	76,339	156,430	87%
2010	33.14	176,257	46,452	30,700	76,115	153,267	87%
2011	22.95	205,120	60,322	36,016	82,027	178,365	87%

Year	Annual Rainfall (in./yr.)	Total Annual Water Diverted (acre-feet)	Annual Irrigation Water Delivered (acre-feet)	Annual Municipal Water Delivered (acre-feet)	Annual Other Water Delivered (acre-feet)	Total Annual Water Delivered (acre-feet)	Estimated Delivery Efficiency (percentage)
Average	31.08	187,091	50,275	34,252	78,160	162,687	87%

6. Practices and/or devices used to account for water deliveries:

Meters are read monthly for the golf courses and the experimental rice farm that pump water from the canals. For farmers that divert water from the canals with screw gates, a written water order and record keeping system is used to account for water delivered.

7. Water pricing policy:

Customer pricing is based on system cost.

8. Operating rules and policies that encourage water conservation:

Irrigation contracts encourage farmers to conserve water by penalizing waste. GCWA Water Tenders patrol the fields daily, checking for signs of water loss and waste.

9. Other management practices and services provided by the district:

The canal system is monitored daily for water losses. GCWA also invests in vegetation control along the canals to reduce evapotranspiration.

### III. USER PROFILE

1. Total number of acres in service area: 89,923

2. Average number of acres irrigated annually: 14,312 acres of first rice crop, with 3,418 acres of second rice crop, and approximately 650 acres of golf course

3. Projected number of acres to be irrigated in 10 years: 14,312 acres of first rice crop, with 3,418 acres of second rice crop, and approximately 650 acres of golf course

4. Number of active irrigation customers: 8 respondents

5. Total irrigation water delivered annually (in acre-feet): 50,275

6. Types of crops grown by customers:



Farmers generally grow rice and golf courses generally grow Bermuda-type grass.

7. Types of irrigation systems used by customer:

Rice farms use canal delivery in order to practice flood irrigation on the fields and golf courses generally pump water from the canal to a sprinkler system.

8. Types of drainage systems used by customers:

The golf courses and rice farms alike use surface drainage to open ditches.

9. Further description of irrigation customers:

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10. List of municipal customers and number of acre-feet allocated annually:

The GCWA Canal Division provides raw water to the Thomas S. Mackey Water Treatment Plant in Texas City and will provide water in the future to customers including the City of Sugar Land, City of Missouri City, City of Pearland, Pecan Grove MUD, and Fort Bend County WCID #2. The primary purpose of the TMWTP is to treat and prepare the water for distribution to municipal and industrial customers in Galveston County. See Section 2.2 in the Water Conservation Plan for more detailed information.

11. List of industrial and other large customers and number of acre-feet allocated annually:

Many industrial customers have take points on the same canals as irrigation and agricultural customers, but the majority are in the Texas City area and draw from the Galveston Canal system. See Section 2.2 in the Water Conservation Plan for more detailed information.

12. Additional information about water users:

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- IV. Describe **specific and quantified five-year and ten-year targets for water savings** including maximum allowable losses for the storage and distribution system:

Five-year targets are to meter the system to the extent practicable for water conservation purposes.

Ten-year targets are to use the information gained from metering to achieve finer detail in water accounting.

- V. Describe the practice(s) and/or device(s) which will be utilized to measure and account for the amount of water diverted from the source(s) of supply:

Water diverted from the Brazos River is metered at or downstream of the diversions.

GCWA is in the process of upgrading its system metering in order to more accurately account for water diversions.

- VI. Describe the monitoring and record management program for water deliveries, sales, and losses:

Irrigation customers are monitored daily and delivered water is measured and recorded manually for billing. Every month, customers with meters have the meters read by GCWA.

- VII. Describe any methods that will be used for water loss control, leak detection, and repair:

Daily inspection of the canal system and timely repair of any leaks discovered will be of paramount importance to achieving the aforementioned goals.

- VIII. Describe any program for customer assistance in the development of on-farm water conservation and pollution prevention measures:

GCWA encourages rice farm customers to practice precision leveling and other methods of reducing on-farm water demand.

GCWA will contractually require all golf course irrigation customers to implement and maintain water conservation plans.

- IX. Describe any other water conservation practice, method, or technique which the supplier shows to be appropriate for achieving conservation (if applicable):

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- X. Additional requirements:

1. There must be a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop

and implement a water conservation plan or water conservation measures using the applicable elements in 30 TAC §288; if the customer intends to resell the water, then the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter.

2. Evidence of official adoption of the water conservation plan and goals, by ordinance, rule, resolution, or tariff, indicating that the plan reflects official policy of the supplier.
3. Documentation of coordination with the Regional Water Planning Groups in order to insure consistency with the appropriate approved regional water plans.

### ***Best Management Practices Guide***

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<http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf>

**If you have any questions on how to fill out this form or about the Water Conservation program, please contact us at 512/239-4691.**

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**Appendix E**  
**Resolution Adopting Water Conservation Plan**

**CERTIFICATE FOR RESOLUTION 2012-004**

STATE OF TEXAS                    §

COUNTY OF GALVESTON    §

I, the undersigned officer of the Board of Directors of Gulf Coast Water Authority, hereby certify as follows:

1.     The Board of Directors of Gulf Coast Water Authority convened in regular meeting on the 20<sup>th</sup> day of September 2012 and the roll was called of the duly constituted officers and members of said Board, to-wit:

Eric Wilson	Vice-President
Rosalyn Sue Edrozo	Secretary-Treasurer
James McWhorter	Assistant Secretary-Treasurer
James R. Cesarini	Director
Bill Eisen	Director
Ray Holbrook	Director
Russell C. Jones	Director
Shane Hamilton	Director

and all of said persons were present, except the following absentee(s):

ERIC WILSON AND ROSALYN SUE EDROZO,  
thus constituting a quorum. Whereupon, among other business, the following was transacted at said meeting: a written

**RESOLUTION NO. 2012-004**


**A RESOLUTION OF THE GULF COAST WATER AUTHORITY, ADOPTING THE AUTHORITY'S WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS; PROVIDING THAT THIS RESOLUTION SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION.**

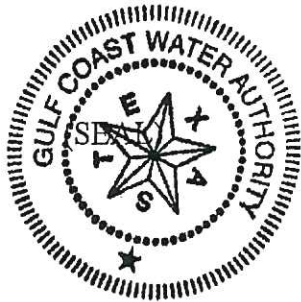
was duly introduced for the consideration of said Board and read in full. It was then duly moved and seconded that said Resolution be adopted; and, after due discussion, said motion, carrying with it the adoption of said Resolution, prevailed and carried unanimously.

2.     That a true, full and correct copy of the aforesaid Resolution adopted at the meeting described in the above and foregoing paragraph is attached to and follows this certificate; that said Resolution has been duly recorded in said Board's minutes of said meeting; that the persons named in the above and foregoing paragraph are the duly chosen, qualified, and acting officers and members of said Board as indicated therein; that each of the officers and members of said Board was duly and sufficiently notified officially and personally, in advance, of the time, place and purpose of the aforesaid

meeting, and that said Resolution would be introduced and considered for adoption at said meeting, and each of said officers and members consented, in advance, to the holding of said meeting for such purpose; that said meeting was open to the public as required by law; and that public notice of the hour, date, place, and subject of said meeting was given as required by Texas Government Code, Chapter 551, and Texas Water Code, Section 49.063.

SIGNED AND SEALED the 20<sup>th</sup> day of September 2012.

  
James F. McWhorter  
Assistant Secretary-Treasurer





**RESOLUTION NO. 2012-004**

**A RESOLUTION OF THE GULF COAST WATER AUTHORITY, ADOPTING THE AUTHORITY'S WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS; PROVIDING THAT THIS RESOLUTION SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION.**

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**WHEREAS**, the Authority recognizes the need for efficient use of existing water supplies and has developed a Water Conservation Plan governing the development of water conservation consistent with guidelines and requirements of the Texas Commission on Environmental Quality (TCEQ); and

**WHEREAS**, Authority has developed a drought contingency plan consistent with Texas Commission on Environmental Quality (TCEQ) guidelines and requirements for the development of drought contingency plans by wholesale water suppliers, as contained in Title 30, Part 1, Chapter 288, Subchapter B, Rules 288.20–288.22 of the Texas Administrative Code; and

**WHEREAS**, the General Manager deems it in the best interest of the Authority to adopt these plans and recommends that these plans be implemented accordingly;

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE GULF COAST WATER AUTHORITY:**

**SECTION 1:** That the Gulf Coast Water Authority hereby adopts its Water Conservation Plan as the official policy of the Gulf Coast Water Authority. A copy of the Water Conservation Plan shall remain on file in the office of the General Manager.


**SECTION 2:** That the Gulf Coast Water Authority hereby adopts its Drought Contingency Plan as the official policy of the Gulf Coast Water Authority. A copy of the Drought Contingency Plan shall remain on file in the office of the General Manager.

**SECTION 3:** That the General Manager is directed to take such actions as necessary to implement the above-named plans, in the best interest of the Authority.

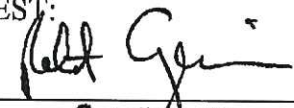
**SECTION 4:** That this Resolution shall be in full force and effect from and after its passage and adoption.

PASSED AND ADOPTED this 20th day of September, 2012.

GULF COAST WATER AUTHORITY

  
James F. McWhorter  
Assistant Secretary-Treasurer

ATTEST:

  
Attorney for GICWA



**Appendix F**  
**Letter to Region H Water Planning Group**





Gulf Coast Water Authority

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3630 Highway 1765

Texas City, Texas 77591

409.935.2438

fax 409.935.4156

October 12, 2012

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

RE: Gulf Coast Water Authority 2012 Water Conservation and Drought Contingency  
Plan Update

Dear Judge Evans,

Enclosed please find a copy of the following documents:

- Water Conservation Plan for Gulf Coast Water Authority
- Drought Contingency Plan for Gulf Coast Water Authority

We are submitting a copy of these plans to the Region H Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The Board of the Gulf Coast Water Authority adopted the attached plans on September 20, 2012.

Sincerely,

Ivan Langford  
General Manager  
Gulf Coast Water Authority

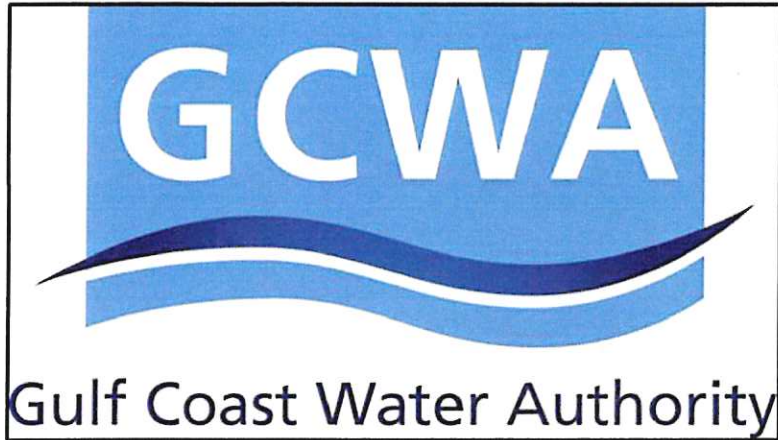
## **Attachment 9**

Addendum to Worksheet 6.0:  
GCWA Drought Contingency Plan

**DROUGHT  
CONTINGENCY PLAN  
FOR GULF COAST  
WATER AUTHORITY**

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**October 2012**

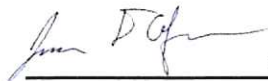


**Prepared for:**

**GULF COAST WATER  
AUTHORITY**



FREESE AND NICHOLS, INC.  
TEXAS REGISTERED  
ENGINEERING FIRM  
F-2144



2012/10/12

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FN0908

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## **1.0 INTRODUCTION**

The purpose of this drought contingency plan (the Plan) for Gulf Coast Water Authority (GCWA) is as follows:

- To conserve the available water supply in times of drought and emergency,
- To maintain supplies for domestic water use, industrial use, sanitation, and fire protection,
- To protect and preserve public health, welfare, and safety,
- To minimize the adverse impacts of water supply shortages,
- To minimize the adverse impacts of emergency water supply conditions, and
- To satisfy the requirements set forth by TCEQ and other agencies.

A drought is defined as an extended period of time when an area receives insufficient amounts of rainfall to replenish the water supply, causing water supply shortages. In the absence of drought response measures, water demands tend to increase during a drought due to the need for additional outdoor irrigation. The severity of a drought depends on the degree of depletion of supplies and on the relationship of demand to available supplies.

## **2.0 TCEQ REQUIREMENTS FOR DROUGHT CONTINGENCY PLANS**

This Plan is consistent with Texas Commission on Environmental Quality (TCEQ) guidelines and requirements for the development of drought contingency plans by wholesale water suppliers, contained in Title 30, Part 1, Chapter 288, Subchapter B, Rules 288.20–288.22 of the Texas Administrative Code. These rules are included in *Appendix A*.

## **3.0 PUBLIC INVOLVEMENT**

Opportunity for the public and GCWA's water customers to provide input into the preparation of the Plan was provided by GCWA through the following measures:

- Providing written notice of the proposed plan and the opportunity to comment on the plan by newspaper, posted notice, and notice on GCWA's website,



- Making the draft plan available on GCWA's web site,
- Providing the draft plan to anyone requesting a copy, and
- Holding a public meeting.

#### **4.0 WATER CUSTOMER EDUCATION**

After the Plan is adopted, GCWA will continue to inform and educate the public about the Plan through the following measures:

- Preparing a bulletin describing the Plan and making it available at appropriate locations,
- Making the Plan available to the public through the web site,
- Including information about the Plan on the web site, and
- Notifying local organizations, schools, and civic groups that GCWA staff are available to make presentations on the Plan (usually in conjunction with presentations on water conservation programs).

#### **5.0 AUTHORIZATION OF DROUGHT RESPONSE**

The GCWA General Manager or his/her designee (the GM), is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The GM shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

#### **6.0 APPLICATION OF DROUGHT RESPONSE MEASURES**

The provisions of this Plan shall apply to all of GCWA's water supply customers. The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, associations, municipalities, political subdivisions, and all other legal entities.

The following actions will be taken when a drought stage is initiated:

- The affected public will be notified through local media,

- GCWA's customers who are potentially affected by a drought or emergency (the Affected Customers) will be notified by e-mail with a follow-up letter or fax that provides details of the reasons for initiation of the drought contingency stage, and
- If any mandatory provisions of the Plan are activated, GCWA will notify the Executive Director of the TCEQ within 5 business days.

The GM may decide not to order the implementation of a drought contingency response stage even though one or more of the trigger criteria for the stage are met. Factors which could influence such a decision include, but are not limited to, the time of the year, weather conditions, the anticipation of replenished water supplies, or the anticipation that additional facilities will become available to meet needs.

## 7.0 CRITERIA AND ACTIONS REQUIRED FOR DROUGHT OR EMERGENCY RESPONSE STAGES FOR AFFECTED CUSTOMERS

This section describes the criteria for and actions required for drought response stages for only Affected Customers based on the concepts of system demand and deliverable capacity, as defined below:

- **Affected Customers:** customers that are impacted by a particular shortage of deliverable capacity compared to system demand.
- **System demand:** demand on the system at a critical point where downstream customers can be affected by a reduction or total loss of service.
- **Deliverable capacity:** the ability to convey water at a given point in the system as limited by river conditions, diversion capacity, conveyance capacity, treatment capacity, etc.

Affected Customers include the customers that have take points downstream of the circumstances that are triggering a drought or emergency response. For instance, GCWA's canal customers may be affected by events impacting river pump stations or canal conveyance to the point of diversion by the customer. Similarly, GCWA treated water customers may be impacted by events concerning the river pump stations and canal conveyances, but also storage in GCWA reservoir, and operation of water treatment and distribution infrastructure. The concept of Affected Customers is intended to limit the scope of drought response to only those customers directly impacted by a significant event, whether it be related to river conditions, pump station capacity, or conveyance and other infrastructure. A summary of the drought stages can be found in *Appendix B*.

### 7.1 STAGE 1 RESPONSE (MILD WATER SHORTAGE)

A Stage 1 Response for Affected Customers can be triggered when:

- The GM finds that conditions warrant the declaration of a Stage 1 Response or
- System demand exceeds 85% of deliverable capacity for three consecutive days.

A Stage 1 Response may be terminated when the circumstances that triggered the initiation of Stage 1 no longer prevail for seven consecutive days, or at the GM's discretion.



The goal for water use under Stage 1 is a 5% reduction of the use that would have occurred in the absence of drought contingency measures. The GM may order the implementation of any of the following actions deemed necessary:

- Notify all Affected Customers that a Stage 1 drought condition exists,
- Require all Affected Customers to initiate Stage 1 or other appropriate stage in their drought contingency plan,
- Request voluntary reductions in water use by Affected Customers, or
- Increase public awareness of drought condition and measures to reduce demand.

If a Stage 1 drought condition is declared, TCEQ will be notified within five days of initiation and termination.

## **7.2 STAGE 2 RESPONSE (MODERATE WATER SHORTAGE)**

A Stage 2 Response for Affected Customers can be triggered when:

- The GM finds that conditions warrant the declaration of a Stage 2 Response or
- System demand exceeds 90% of deliverable capacity for three consecutive days.

A Stage 2 Response may be terminated when the circumstances that caused the initiation of Stage 2 no longer prevail for seven consecutive days, or at the GM's discretion.

The goal for water use reduction under a Stage 2 Response is a 10% reduction of the use that would have occurred in the absence of drought contingency response measures. If the circumstances warrant, the GM can set a goal for greater water use reduction.

The GM may order the implementation of any of the actions listed below as deemed necessary. The Stage 2 Response measures are as follows:

- Continue or initiate any actions available under Stage 1,
- Notify all Affected Customers that a Stage 2 drought condition exists,

- Require Affected Customers to initiate Stage 2 or other appropriate stage in their drought contingency plan,
- Meet with Affected Customers to determine water use on a weekly basis, identify Affected Customers exceeding 95% of their contract amount, and advise them to reduce their usage,
- Cease issuance of new short-term or interruptible contracts with the exception of emergency conditions
- Terminate existing interruptible contracts, or
- **Requires TCEQ Notification:** Impose mandatory reductions in water use by Affected Customers.

If a Stage 2 drought condition is declared, TCEQ will be notified within five days of initiation and termination.

### **7.3 STAGE 3 RESPONSE (SEVERE WATER SHORTAGE)**

A Stage 3 Response for Affected Customers can be triggered when:

- The GM finds that conditions warrant the declaration of a Stage 3 Response or
- System demand exceeds 95% of deliverable capacity for three consecutive days.

A Stage 3 Response may be terminated when the circumstances that caused the initiation of Stage 3 no longer prevail for seven consecutive days, or at the GM's discretion.

The goal for water use reduction under a Stage 3 Response is a 20% reduction in the use that would have occurred in the absence of drought contingency measures. If the circumstances warrant, the GM can set a goal for greater water use reduction.

The GM may order the implementation of any of the actions listed below as deemed necessary. The Stage 3 Response measures are as follows:

- Continue or initiate any actions available under Stages 1 and 2,
- Notify all Affected Customers that a Stage 3 drought condition exists,

- Require Affected Customers to initiate Stage 3 or other appropriate stage in their drought contingency plan,
- Continue to coordinate with Affected Customers to determine water use on a daily basis, identify Affected Customers exceeding 85% of their contract amount, and advise them to reduce their usage,
- Encourage Affected Customers to engage alternative sources of supply where feasible, or
- **Requires TCEQ Notification:** Impose mandatory water rationing under TWC §11.039 to reduce demand below the Stage 3 trigger point.

If a Stage 3 drought condition is declared, TCEQ will be notified within five days of initiation and termination.

#### **7.4 WATER EMERGENCY RESPONSE (EMERGENCY WATER SHORTAGE)**

A Water Emergency Response for Affected Customers can be triggered when the GM finds that conditions warrant the declaration of a Water Emergency Response because:

- A major system failure leading to loss of water service occurs; or
- The water supply becomes contaminated and unusable; or
- Other emergency conditions exist as determined by the GM.

A Water Emergency Response may be terminated when the circumstances that caused the initiation of the Water Emergency Response no longer prevail for twenty-four hours, or at the GM's discretion.

The goal for water use reduction under a Water Emergency Response is subject to the scope of the emergency. The GM may order the implementation of any of the actions listed below as deemed necessary. The Water Emergency Response measures are as follows:

- Continue or initiate any actions available under Stage 1, 2, and 3,
- Notify all Affected Customers that an emergency condition exists and meet with Affected Customers as appropriate to inform them of the specific nature of the emergency condition,



- Require Affected Customers to initiate the emergency or other appropriate stage in their drought contingency plan, or
- **Requires TCEQ Notification:** Impose mandatory water rationing under TWC §11.039 to reduce demand to the appropriate level as determined by the GM.

If an emergency condition is declared, TCEQ will be notified within five days of initiation and termination.

## **8.0 WATER ALLOCATION**

In the event that the triggering criteria specified herein has been met, the GM is hereby authorized to initiate allocation of water supplies on a pro rata basis among all the Affected Customers according to the amount to which each Affected Customer may be entitled so that preference is given to none and all Affected Customers suffer alike, in accordance with Texas Water Code, §11.039.

## **9.0 ENFORCEMENT**

Any mandatory reduction to deliveries from GCWA to Affected Customers shall be distributed as required by Texas Water Code §11.039 (§11.039) and Section 8 above. In addition, every wholesale water supply contract entered into or renewed after adoption of this Plan, including contract extensions, shall include a provision that water will be distributed in accordance with §11.039 in case of a water shortage.

## **10.0 VARIANCES**

The GM may, in writing, grant a temporary variance for existing water uses otherwise prohibited under this Plan to an Affected Customer if one or more of the following conditions are met:

- Failure to grant such a variance would cause an emergency condition adversely affecting health, sanitation, or fire safety for the public or the Affected Customer requesting the variance,
- Compliance with this Plan cannot be accomplished due to technical, legal, or other limitations, or
- Alternative methods that achieve the same level of reduction in water use can be implemented.

Variances shall be granted or denied at the discretion of the GM. All petitions for variances should be in writing and should include the following information:

- Name and address of the petitioner(s),
- Purpose of water use,
- Specific provisions from which relief is requested,

- Detailed statement of the adverse effect of the provisions from which relief is requested,
- Description of the relief requested,
- Period of time for which the variance is sought,
- Alternative measures that will be taken to reduce water use, and
- Other pertinent information.

## **11.0 SEVERABILITY**

It is hereby declared to be the intention of the GCWA that the sections, paragraphs, sentences, clauses, and phrases of this Plan are severable and, if any phrase, clause, sentence, paragraph, or section of this Plan shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this Plan, since the same would not have been enacted by GCWA without the incorporation into this Plan of any such unconstitutional phrase, clause, sentence, paragraph, or section.

## **12.0 IMPLEMENTATION**

This plan was adopted by Gulf Coast Water Authority via a resolution passed by the Board of Directors on September 20, 2012. A copy of this resolution may be found in *Appendix C* of this document.

### **12.1 COORDINATION WITH REGIONAL WATER PLANNING GROUPS**

The service area of GCWA is located within Region H as defined by the Texas Water Development Board. GCWA has provided a copy of this drought contingency plan to Region H, along with the letter shown in *Appendix D*.

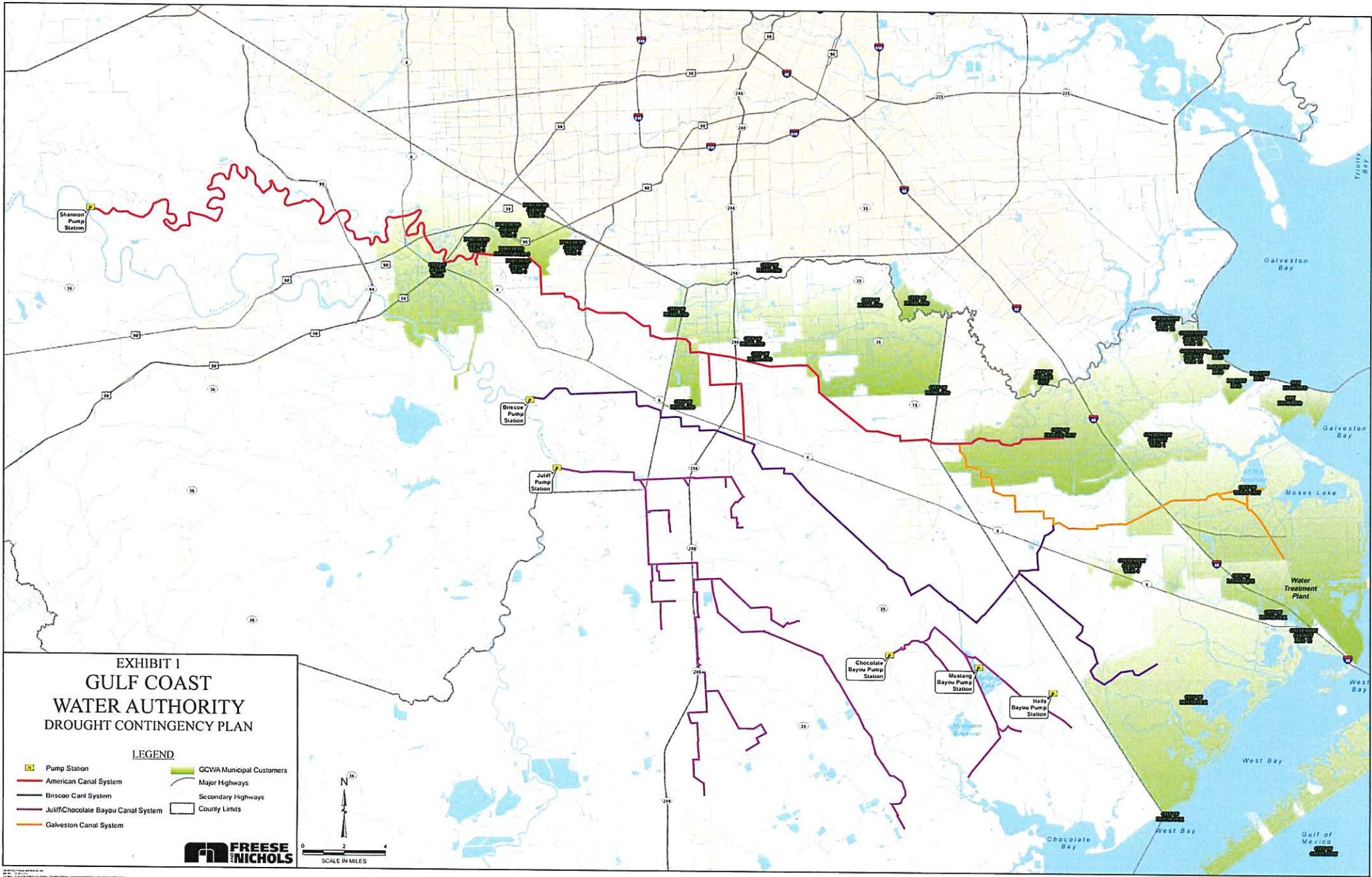
### **12.2 REVIEW AND UPDATE OF DROUGHT CONTINGENCY PLAN**

As required by TCEQ rules, GCWA will review and update this plan, as appropriate based on an assessment of any other new or updated information. GCWA will review and update the Plan no later than September 20, 2017, and every five years after that date to satisfy TCEQ requirements.



**Exhibit 1**

**Overall System Map**





## **Appendix A**

### **Texas Commission on Environmental Quality Rules on Drought Contingency Plans**



<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER B</u></b>	DROUGHT CONTINGENCY PLANS
<b>RULE §288.20</b>	<b>Drought Contingency Plans for Municipal Uses by Public Water Suppliers</b>

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(a) A drought contingency plan for a retail public water supplier, where applicable, must include the following minimum elements.

(1) Minimum requirements. Drought contingency plans must include the following minimum elements.

(A) Preparation of the plan shall include provisions to actively inform the public and affirmatively provide opportunity for public input. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting.

(B) Provisions shall be made for a program of continuing public education and information regarding the drought contingency plan.

(C) The drought contingency plan must document coordination with the regional water planning groups for the service area of the retail public water supplier to ensure consistency with the appropriate approved regional water plans.

(D) The drought contingency plan must include a description of the information to be monitored by the water supplier, and specific criteria for the initiation and termination of drought response stages, accompanied by an explanation of the rationale or basis for such triggering criteria.

(E) The drought contingency plan must include drought or emergency response stages providing for the implementation of measures in response to at least the following situations:

- (i) reduction in available water supply up to a repeat of the drought of record;
- (ii) water production or distribution system limitations;
- (iii) supply source contamination; or
- (iv) system outage due to the failure or damage of major water system components (e.g., pumps).

(F) The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this subparagraph are not enforceable.

(G) The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following:

- (i) curtailment of non-essential water uses; and
  - (ii) utilization of alternative water sources and/or alternative delivery mechanisms with the prior approval of the executive director as appropriate (e.g., interconnection
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with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).

(H) The drought contingency plan must include the procedures to be followed for the initiation or termination of each drought response stage, including procedures for notification of the public.

(I) The drought contingency plan must include procedures for granting variances to the plan.

(J) The drought contingency plan must include procedures for the enforcement of mandatory water use restrictions, including specification of penalties (e.g., fines, water rate surcharges, discontinuation of service) for violations of such restrictions.

(2) Privately-owned water utilities. Privately-owned water utilities shall prepare a drought contingency plan in accordance with this section and incorporate such plan into their tariff.

(3) Wholesale water customers. Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply.

(b) A wholesale or retail water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan.

(c) The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as the adoption or revision of the regional water plan.

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**Source Note:** The provisions of this §288.20 adopted to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384

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<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER B</u></b>	DROUGHT CONTINGENCY PLANS
<b>RULE §288.21</b>	<b>Drought Contingency Plans for Irrigation Use</b>

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(a) A drought contingency plan for an irrigation use, where applicable, must include the following minimum elements.

(1) Minimum requirements. Drought contingency plans for irrigation water suppliers must include policies and procedures for the equitable and efficient allocation of water on a pro rata basis during times of shortage in accordance with Texas Water Code, §11.039. Such plans shall include the following elements as a minimum.

(A) Preparation of the plan shall include provisions to actively inform and to affirmatively provide opportunity for users of water from the irrigation system to provide input into the preparation of the plan and to remain informed of the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the water users and providing written notice to the water users concerning the proposed plan and meeting.

(B) The drought contingency plan must document coordination with the regional water planning groups to ensure consistency with the appropriate approved regional water plans.

(C) The drought contingency plan must include water supply criteria and other considerations for determining when to initiate or terminate water allocation procedures, accompanied by an explanation of the rationale or basis for such triggering criteria.

(D) The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this subparagraph are not enforceable.

(E) The drought contingency plan must include methods for determining the allocation of irrigation supplies to individual users.

(F) The drought contingency plan must include a description of the information to be monitored by the water supplier and the procedures to be followed for the initiation or termination of water allocation policies.

(G) The drought contingency plan must include procedures for use accounting during the implementation of water allocation policies.

(H) The drought contingency plan must include policies and procedures, if any, for the transfer of water allocations among individual users within the water supply system or to users outside the water supply system.

(I) The drought contingency plan must include procedures for the enforcement of water allocation policies, including specification of penalties for violations of such policies and for wasteful or excessive use of water.

(2) Wholesale water customers. Any irrigation water supplier that receives all or a

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portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan, appropriate provisions for responding to reductions in that water supply.

(3) Protection of public water supplies. Any irrigation water supplier that also provides or delivers water to a public water supplier(s) shall consult with that public water supplier(s) and shall include in the plan, mutually agreeable and appropriate provisions to ensure an uninterrupted supply of water necessary for essential uses relating to public health and safety. Nothing in this provision shall be construed as requiring the irrigation water supplier to transfer irrigation water supplies to non-irrigation use on a compulsory basis or without just compensation.

(b) Irrigation water users shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as adoption or revision of the regional water plan.

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**Source Note:** The provisions of this §288.21 adopted to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384

<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER B</u></b>	DROUGHT CONTINGENCY PLANS
<b><u>RULE §288.22</u></b>	<b>Drought Contingency Plans for Wholesale Water Suppliers</b>

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(a) A drought contingency plan for a wholesale water supplier must include the following minimum elements.

(1) Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting.

(2) The drought contingency plan must document coordination with the regional water planning groups for the service area of the wholesale public water supplier to ensure consistency with the appropriate approved regional water plans.

(3) The drought contingency plan must include a description of the information to be monitored by the water supplier and specific criteria for the initiation and termination of drought response stages, accompanied by an explanation of the rationale or basis for such triggering criteria.

(4) The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record.

(5) The drought contingency plan must include the procedures to be followed for the initiation or termination of drought response stages, including procedures for notification of wholesale customers regarding the initiation or termination of drought response stages.

(6) The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable.

(7) The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following:

(A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and

(B) utilization of alternative water sources with the prior approval of the executive director as appropriate (e.g., interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).

(8) The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be

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distributed shall be divided in accordance with Texas Water Code, §11.039.

(9) The drought contingency plan must include procedures for granting variances to the plan.

(10) The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions.

(b) The wholesale public water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan.

(c) The wholesale public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as adoption or revision of the regional water plan.

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**Source Note:** The provisions of this §288.22 adopted to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384



**Appendix B**  
**Quick Reference Guide**

Stage	Water Shortage Condition	Trigger	Termination	Goal for Reduction in Water Use	Appropriate Actions
1	Mild	Discretion of GCWA General Manager.	Discretion of GCWA General Manager.	5%	Notify Affected Customers that a Stage 1 drought condition exists.
		System demand exceeds 85% of deliverable capacity for 3 consecutive days.	7 days without any trigger conditions.		Require Affected Customers to initiate Stage 1 or other appropriate stage in their drought contingency plan.
					Request voluntary reductions in water use by customers.
					Increase public awareness of drought condition and measures to reduce demand.
					Notify TCEQ of Stage 1 condition.
2	Moderate	Discretion of GCWA General Manager.	Discretion of GCWA General Manager.	10%	Continue Stage 1 efforts.
		System demand exceeds 90% of deliverable capacity for 3 consecutive days.	7 days without any trigger conditions		Notify Affected Customers that a Stage 2 drought condition exists.
					Require Affected Customers to initiate Stage 2 or other appropriate stage in their drought contingency plan.
					Meet with Affected Customers to discuss measures that may be taken to reduce demand if condition worsens, such as engagement of an alternative water supply.
					Coordinate with Affected Customers to determine water use on a weekly basis, identify users exceeding 95% of their contract amount, and advise them to reduce their usage.
					Cease issuance of new short-term or interruptible contracts with the exception of emergency conditions.
					Terminate existing interruptible contracts
					Impose mandatory reductions in water use by Affected Customers.
Notify TCEQ of Stage 2 condition.					
3	Severe	Discretion of GCWA General Manager.	Discretion of GCWA General Manager.	20%	Continue Stage 2 efforts.
		System demand exceeds 95% of deliverable capacity for 3 consecutive days.	7 days without any trigger conditions		Notify Affected Customers that a Stage 3 drought condition exists.
					Require Affected Customers to initiate Stage 3 or other appropriate stage in their drought contingency plan.
					Continue to coordinate with Affected Customers to determine water use on a daily basis, identify users exceeding 85% of their contract amount, and advise them to reduce their usage.
					Encourage Affected Customers to engage alternative sources of supply where feasible.
					May impose mandatory water rationing under TWC 11.039 to reduce demand below the Stage 3 trigger point.
Notify TCEQ of Stage 3 Condition.					
4	Emergency	Discretion of GCWA General Manager.	Discretion of GCWA General Manager.	Subject to Scope of Emergency	Notify Affected Customers that a Emergency condition exists. Meet with customers as appropriate to inform them of the specific nature of the emergency condition.
		Major system failure leading to loss of water service.	24 hours without any trigger conditions		Require Affected Customers to initiate Emergency or appropriate stage in their drought contingency plan.
		Contamination of water supply.			Impose mandatory water rationing under TWC 11.039 to reduce demand to the appropriate level.
					Issue a Boil Water notice to Affected Customers (if applicable).
					Notify TCEQ of Emergency Condition.

## **Appendix C**

### **Resolution Adopting Drought Contingency Plan**



**CERTIFICATE FOR RESOLUTION 2012-004**

STATE OF TEXAS                   §

COUNTY OF GALVESTON   §

I, the undersigned officer of the Board of Directors of Gulf Coast Water Authority, hereby certify as follows:

1.     The Board of Directors of Gulf Coast Water Authority convened in regular meeting on the 20<sup>th</sup> day of September 2012 and the roll was called of the duly constituted officers and members of said Board, to-wit:

Eric Wilson	Vice-President
Rosalyn Sue Edrozo	Secretary-Treasurer
James McWhorter	Assistant Secretary-Treasurer
James R. Cesarini	Director
Bill Eisen	Director
Ray Holbrook	Director
Russell C. Jones	Director
Shane Hamilton	Director

and all of said persons were present, except the following absentee(s):

ERIC WILSON AND ROSALYN SUE EDROZO,  
thus constituting a quorum. Whereupon, among other business, the following was transacted at said meeting: a written

**RESOLUTION NO. 2012-004**

**A RESOLUTION OF THE GULF COAST WATER AUTHORITY, ADOPTING THE AUTHORITY'S WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS; PROVIDING THAT THIS RESOLUTION SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION.**

was duly introduced for the consideration of said Board and read in full. It was then duly moved and seconded that said Resolution be adopted; and, after due discussion, said motion, carrying with it the adoption of said Resolution, prevailed and carried unanimously.

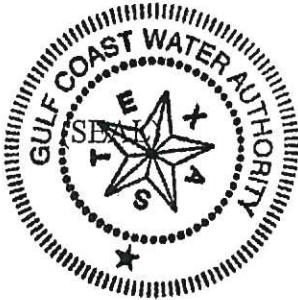
2.     That a true, full and correct copy of the aforesaid Resolution adopted at the meeting described in the above and foregoing paragraph is attached to and follows this certificate; that said Resolution has been duly recorded in said Board's minutes of said meeting; that the persons named in the above and foregoing paragraph are the duly chosen, qualified, and acting officers and members of said Board as indicated therein; that each of the officers and members of said Board was duly and sufficiently notified officially and personally, in advance, of the time, place and purpose of the aforesaid

meeting, and that said Resolution would be introduced and considered for adoption at said meeting, and each of said officers and members consented, in advance, to the holding of said meeting for such purpose; that said meeting was open to the public as required by law; and that public notice of the hour, date, place, and subject of said meeting was given as required by Texas Government Code, Chapter 551, and Texas Water Code, Section 49.063.

SIGNED AND SEALED the 20<sup>th</sup> day of September 2012.



James F. McWhorter  
Assistant Secretary-Treasurer



**RESOLUTION NO. 2012-004**

**A RESOLUTION OF THE GULF COAST WATER AUTHORITY, ADOPTING THE AUTHORITY'S WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS; PROVIDING THAT THIS RESOLUTION SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION.**

---

**WHEREAS**, the Authority recognizes the need for efficient use of existing water supplies and has developed a Water Conservation Plan governing the development of water conservation consistent with guidelines and requirements of the Texas Commission on Environmental Quality (TCEQ); and

**WHEREAS**, Authority has developed a drought contingency plan consistent with Texas Commission on Environmental Quality (TCEQ) guidelines and requirements for the development of drought contingency plans by wholesale water suppliers, as contained in Title 30, Part 1, Chapter 288, Subchapter B, Rules 288.20–288.22 of the Texas Administrative Code; and

**WHEREAS**, the General Manager deems it in the best interest of the Authority to adopt these plans and recommends that these plans be implemented accordingly;

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE GULF COAST WATER AUTHORITY:**

**SECTION 1:** That the Gulf Coast Water Authority hereby adopts its Water Conservation Plan as the official policy of the Gulf Coast Water Authority. A copy of the Water Conservation Plan shall remain on file in the office of the General Manager.

**SECTION 2:** That the Gulf Coast Water Authority hereby adopts its Drought Contingency Plan as the official policy of the Gulf Coast Water Authority. A copy of the Drought Contingency Plan shall remain on file in the office of the General Manager.

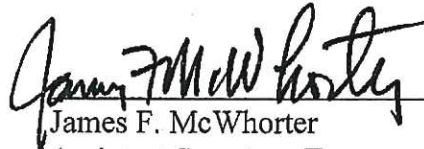
**SECTION 3:** That the General Manager is directed to take such actions as necessary to implement the above-named plans, in the best interest of the Authority.

**SECTION 4:** That this Resolution shall be in full force and effect from and after its passage and adoption.




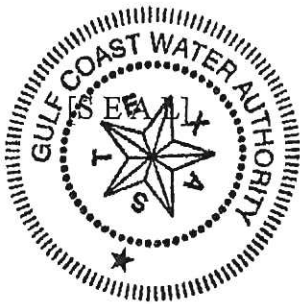
PASSED AND ADOPTED this 20th day of September, 2012.

GULF COAST WATER AUTHORITY

  
James F. McWhorter  
Assistant Secretary-Treasurer

ATTEST:

  
Attorney for GFWA



## **Appendix D**

### **Letter to Region H Water Planning Group**



Gulf Coast Water Authority

---

3630 Highway 1765

Texas City, Texas 77591

409.935.2438

fax 409.935.4156

October 12, 2012

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

RE: Gulf Coast Water Authority 2012 Water Conservation and Drought Contingency  
Plan Update

Dear Judge Evans,

Enclosed please find a copy of the following documents:

- Water Conservation Plan for Gulf Coast Water Authority
- Drought Contingency Plan for Gulf Coast Water Authority

We are submitting a copy of these plans to the Region H Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The Board of the Gulf Coast Water Authority adopted the attached plans on September 20, 2012.

Sincerely,

Ivan Langford  
General Manager  
Gulf Coast Water Authority



**CERTIFICATE FOR RESOLUTION 2012-004**

STATE OF TEXAS                    §

COUNTY OF GALVESTON    §

I, the undersigned officer of the Board of Directors of Gulf Coast Water Authority, hereby certify as follows:

1.     The Board of Directors of Gulf Coast Water Authority convened in regular meeting on the 20<sup>th</sup> day of September 2012 and the roll was called of the duly constituted officers and members of said Board, to-wit:

Eric Wilson	Vice-President
Rosalyn Sue Edrozo	Secretary-Treasurer
James McWhorter	Assistant Secretary-Treasurer
James R. Cesarini	Director
Bill Eisen	Director
Ray Holbrook	Director
Russell C. Jones	Director
Shane Hamilton	Director

and all of said persons were present, except the following absentee(s):

ERIC WILSON AND ROSALYN SUE EDROZO,  
thus constituting a quorum. Whereupon, among other business, the following was transacted at said meeting: a written

**RESOLUTION NO. 2012-004**


**A RESOLUTION OF THE GULF COAST WATER AUTHORITY, ADOPTING THE AUTHORITY'S WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS; PROVIDING THAT THIS RESOLUTION SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION.**

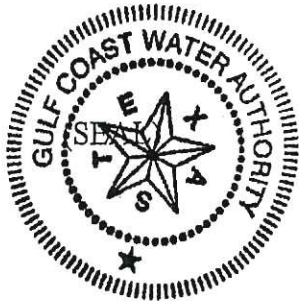
was duly introduced for the consideration of said Board and read in full. It was then duly moved and seconded that said Resolution be adopted; and, after due discussion, said motion, carrying with it the adoption of said Resolution, prevailed and carried unanimously.

2.     That a true, full and correct copy of the aforesaid Resolution adopted at the meeting described in the above and foregoing paragraph is attached to and follows this certificate; that said Resolution has been duly recorded in said Board's minutes of said meeting; that the persons named in the above and foregoing paragraph are the duly chosen, qualified, and acting officers and members of said Board as indicated therein; that each of the officers and members of said Board was duly and sufficiently notified officially and personally, in advance, of the time, place and purpose of the aforesaid

meeting, and that said Resolution would be introduced and considered for adoption at said meeting, and each of said officers and members consented, in advance, to the holding of said meeting for such purpose; that said meeting was open to the public as required by law; and that public notice of the hour, date, place, and subject of said meeting was given as required by Texas Government Code, Chapter 551, and Texas Water Code, Section 49.063.

SIGNED AND SEALED the 20<sup>th</sup> day of September 2012.

  
James F. McWhorter  
Assistant Secretary-Treasurer



**RESOLUTION NO. 2012-004**

**A RESOLUTION OF THE GULF COAST WATER AUTHORITY, ADOPTING THE AUTHORITY'S WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS; PROVIDING THAT THIS RESOLUTION SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION.**

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**WHEREAS**, Authority has developed a drought contingency plan consistent with Texas Commission on Environmental Quality (TCEQ) guidelines and requirements for the development of drought contingency plans by wholesale water suppliers, as contained in Title 30, Part 1, Chapter 288, Subchapter B, Rules 288.20–288.22 of the Texas Administrative Code; and

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**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE GULF COAST WATER AUTHORITY:**

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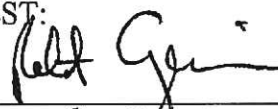


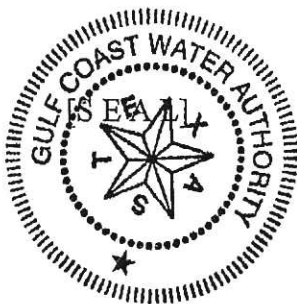
PASSED AND ADOPTED this 20th day of September, 2012.

GULF COAST WATER AUTHORITY

  
James F. McWhorter  
Assistant Secretary-Treasurer

ATTEST:

  
Attorney for GCWA



## **Attachment 10**

Addendum to Worksheet 7.0:  
Water Right Accounting Plan Report



Innovative approaches  
Practical results  
Outstanding service

# WATER RIGHT ACCOUNTING PLAN

Prepared for:

**Gulf Coast Water Authority**



Prepared by:

**FREESE AND NICHOLS, INC.**  
10497 Town and Country Way, Suite 600  
Houston, TX 77024  
713-600-6800

GCW16688



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## ACRONYMS AND ABBREVIATIONS

BRA	Brazos River Authority
CoA	Certificate of Adjudication
GCWA	Gulf Coast Water Authority
PHDI	Palmer Hydrologic Drought Index
SB3	Senate Bill 3
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
USGS	United States Geological Survey

## UNITS

ac-ft	acre-feet
ac-ft/yr	acre-feet/year
cfs	cubic feet/second



## 1. INTRODUCTION

Gulf Coast Water Authority (GCWA), as part of an ongoing process to pursue more flexible utilization of its Brazos River water supplies, has engaged in development of an accounting plan (GCWA Accounting Plan) to facilitate tracking of their water right diversions from the Brazos River, including anticipated amendments to existing water rights. The Accounting Plan, once approved by the Texas Commission on Environmental Quality (TCEQ), will be maintained in an electronic format and made available to the public and the Executive Director of the TCEQ upon request. Any modifications to the Accounting Plan must be approved by TCEQ. Flow parameters, water right authorizations, contractual authorizations, and Accounting Plan workbook operation for the proposed Accounting Plan workbook are discussed in greater detail in the following sections.

## 2. GCWA BRAZOS RIVER SUPPLY OVERVIEW

### 2.1 GCWA WATER RIGHTS

GCWA is the right holder of three water rights on the Brazos River: Certificates of Adjudication (CoA) 12-5168, 12-5171, and 12-5322. While the accounting plan is designed to accommodate proposed amendments to these rights, allowing all three rights to be used for any authorized purpose at any of GCWA's Brazos River diversion locations, it is assumed that certain key parameters such as authorized annual diversion amounts, priority dates, and maximum diversion rates would be maintained. Key parameters of these water rights incorporated into the accounting plan are summarized in **Table 2-1**.

**Table 2-1: GCWA Brazos River Water Rights**

Right	Priority Date	Annual Volume (ac-ft)	Maximum Rate (cfs)	
12-5168	1/15/1926	99,932	685	
12-5171	12/12/1950	50,000	600	600*
	2/1/1939	75,000	600	
12-5322	7/25/1983	75,000	900	900*
	3/14/1955	40,000	668	
	2/8/1929	40,000	400	

\*Combined rate for full Certificate of Adjudication.

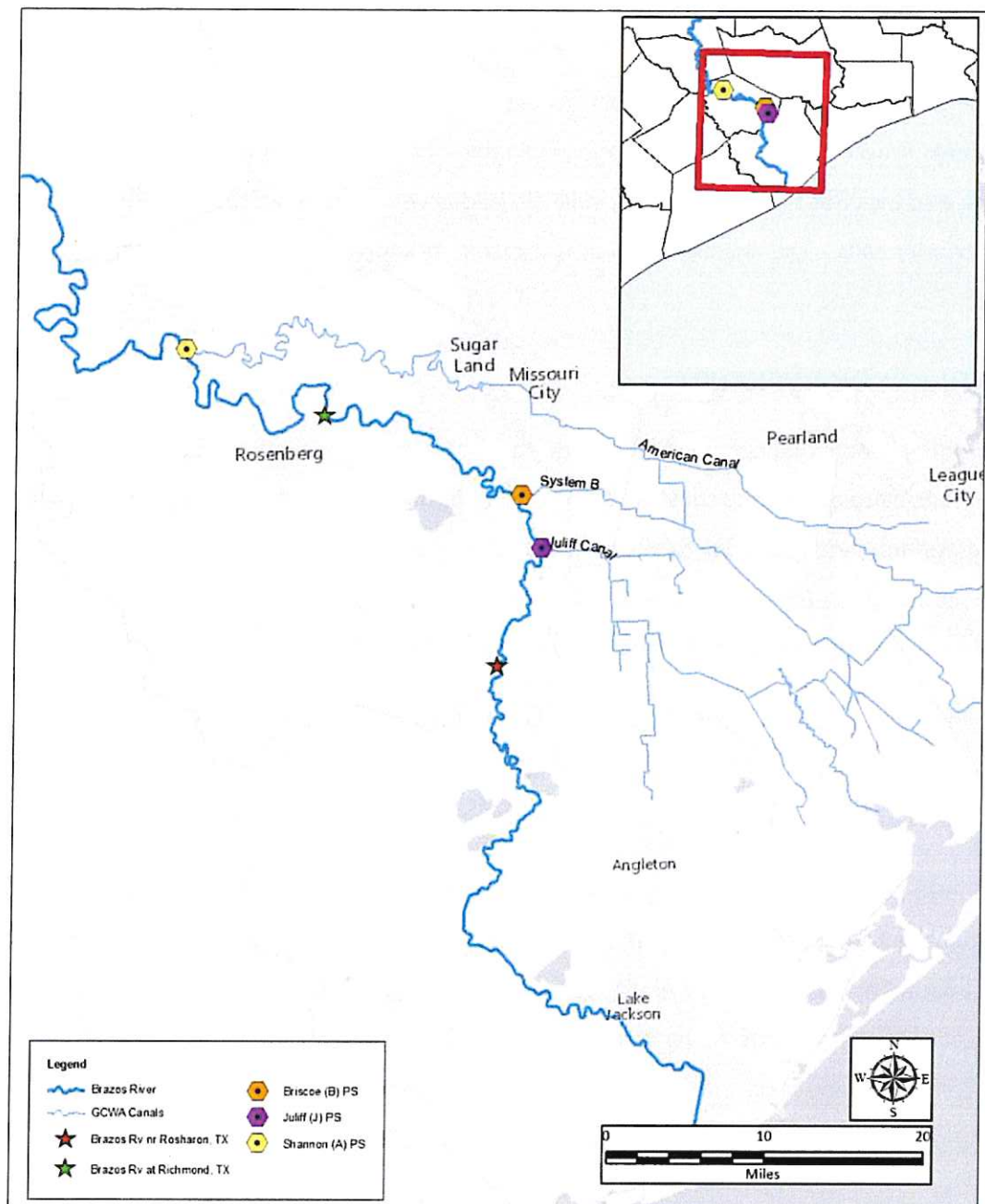
## 2.2 CONTRACTUAL SUPPLIES TO GCWA

GCWA has entered into a number of contracts to receive additional surface water supply, including contracts with the Brazos River Authority (BRA). Through these contracts, GCWA has access to additional water supplies beyond its own water rights, which may be diverted by GCWA downstream at its Brazos River take points. The number and volume of these contracts may change over time. GCWA also has the ability to divert water from the Brazos River contracted to various other entities through assignment by those entities to GCWA or through other mechanisms. The number and volume of these contracts may change over time.

## 2.3 GCWA TAKE POINTS

GCWA operates three take points on the Brazos River, as shown in **Figure 2-1**. Take point A (Shannon pump station) is located slightly south of the City of Fulshear and diverts flows into GCWA's American Canal. Take point B (Briscoe pump station) is located downstream near the Sienna Plantation community and diverts water into the Briscoe Canal. Take point J (May pump station) is slightly downstream of point B and diverts water into the Juliff Canal. Water diverted from the Brazos River by GCWA is authorized and currently diverted for use in the San Jacinto-Brazos Coastal Basin.

Figure 2-1: GCWA Brazos River Take Points





### **3. ELEMENTS OF THE ACCOUNTING PLAN**

The Accounting Plan is designed to track diversions from the Brazos River while meeting TCEQ requirements. Major elements of the Plan include checks for compliance with SB3 environmental flow requirements, tracking of priority calls, and compilation of summary data for water right reporting. The workbook also includes functionality to handle situations which are not anticipated to occur frequently such as priority calls. The Accounting Plan workbook structure is discussed in detail in the following sections.

#### **3.1 WORKBOOK OVERVIEW**

The Accounting Plan workbook has been designed for streamlined usability by providing dedicated tabs for data entry, calculations, and summarization. Columns have been given descriptive names and include identifiers for units and to differentiate inputs and calculations. Where practicable, columns are arranged to minimize the need for the user or reviewer to move frequently among tabs, and long or complex calculations have been broken down into multiple logical steps to make them easier to understand.

Shading has been applied within the accounting plan workbook to assist the user in recognizing the function of certain cells. Yellow shading identifies a location for regular user input. Manual overrides of calculated values or raw inputs are shown in gray. White (unshaded) cells contain automatic calculations.

In addition to the regular cell shading described above, the accounting plan also applies visual cues to differentiate cells and columns intended for input, overrides, and calculations as well as indication of potential data entry issues. For example, cells associated with priority water right calls are shaded blue when a call is in place. Red shading is used to identify potential data entry errors and assist the user in finding the location and cause of the error. Warnings of potential issues are designed to be visually distinct and are generally reflected both on the tab that the potential issue occurs on and on the summary panel.

#### **3.2 WORKBOOK INTEGRITY AND ACCESSIBILITY**

In order to prevent inadvertent modification of calculations, the tabs within the workbook have been locked to limit the user to only being able to modify the contents of cells used for inputs or overrides. This feature has been configured to allow the user to retain the ability to copy the values in any cells, input or otherwise, for export to other documents. If it is necessary to copy or examine formulas, the user may

disable the protection on one or more tabs using the password “gcwa”. It is highly recommended that sheet protection be maintained.

Also, it should be noted that a limited number of calculations within the workbook rely upon a custom function which is not native to Microsoft Excel. This function will not work in all potential Microsoft Excel file formats. When saving a copy of the workbook, the user should use a macro-enabled format such as .xlsm or .xlsb.

### 3.3 WORKBOOK TABS

The accounting plan workbook contains the following tabs for data entry, calculations, summary of results, and reference data. Each of these tabs is described in greater detail in subsequent sections of this document.

- **Intro** – Introductory tab providing links to the other tabs as well as a key to the major cell shading conventions applied in the workbook.
- **Tab 1 (Summary of Results)** – Includes a condensed overview of cumulative usage of GCWA water rights, diversion rates, remaining diversions requiring allocation by the user, and notification of potential conflicts or data entry issues.
- **Tab 2 (Input Data Sheet for Basic Data)** – Provides a location for inputs related to priority water right calls and stream flow measurements. For purposes of the accounting plan, the term priority call as is also intended to include advance communication of the Watermaster to GCWA that water at a specific priority date is needed downstream to meet a senior need as documented through a Declaration of Intent to Divert.
- **Tab 3 (Input Data Sheet for Diversion Location A)** – Serves as the location for input of diversions from the Brazos River at Location A (Shannon) as well as assignment of this volume against portions of GCWA water rights or other sources accessible by GCWA. The tab also provides indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, environmental flow requirements, or other factors.
- **Tab 4 (Input Data Sheet for Diversion Location B)** – Serves as the location for input of diversions from the Brazos River at Location B (Briscoe) as well as assignment of this volume against portions of GCWA water rights or other sources accessible by GCWA. The tab also provides indicators of

when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, or other factors.

- **Tab 5 (Input Data Sheet for Diversion Location J)** – Serves as the location for input of diversions from the Brazos River at Location J (Juliff) as well as assignment of this volume against portions of GCWA water rights or other sources accessible by GCWA. The tab also provides indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, or other factors.
- **Tab 6 (Summary of Diversions by Source and Location)** – Summarizes monthly diversions by water right and diversion location, as well as diversions counted against other sources accessible by GCWA.
- **Tab 7 (Water Rights Reporting)** – Presents the monthly diversions by water right from Tab 6 in a more condensed form without reference to diversion location.
- **Tab 8 (Daily Computations for Run-of-River Rights)** – Acts as the primary location for calculations related to GCWA run-of-river water right accessibility, including tracking of cumulative and remaining supplies by right and priority. The tab also examines other factors which could impact daily accessibility of an authorization, including priority calls, permitted diversion rates, and environmental flows. The calculations on this tab are referenced on Tabs 3 – 5 to provide the user with an indicator of whether or not a particular appropriation is usable each day.
- **Tab 9 (Instream Flow Computations for Richmond Gage)** – Tracks attainment of SB3 environmental flows requirements for the gaging station USGS 08114000 (Brazos Rv at Richmond, TX). This tab is used by Tabs 3 and 8 as part of the logic to determine daily accessibility of CoA 12-5322 at Location A.
- **Tab 10 (Instream Flow Charts for Richmond Gage)** – Illustrates measured river flow, SB3 flow criteria, and base flow status for USGS 08114000 (Brazos Rv at Richmond, TX).
- **Tab R1 (General Reference Data)** – Contains general reference information on water right parameters, environmental flow parameters, and unit conversion factors. The Reference tab also provides a location for inputs which do not need to occur at a daily timescale.



- **Tab R2 (Drop Down Selection Reference)** – Contains a static reference list of GCWA water right priority dates which is utilized by drop-down selections on other tabs of the workbook.

### 3.3.1 Tab 1 (Summary of Results)

Tab 1 includes a condensed overview of cumulative usage of GCWA water rights and other sources, diversion rates, remaining diversions requiring allocation by the user, and notification of potential conflicts or data entry issues. Specific sections of the tab are discussed in greater detail below.

#### 3.3.1.1 GCWA Run-of-River Rights

This table provides a condensed summary of usage of GCWA run-of-river water rights based on the user inputs and calculations from the other tabs of the workbook. Parameters shown include year-to-date diversions, remaining unused annual appropriations, percent of annual appropriations used, and maximum diversion rates. Results in excess of allowable values trigger conditional formatting within the section to alert the user to potential data entry issues.

#### 3.3.1.2 Meter Recordings

This table provides a condensed summary of diversions from each of GCWA's three Brazos River diversion locations. Parameters shown include summaries from GCWA water rights and other sources accessible by GCWA, diversion rates, and any over- or under-allocation of diversions. Results in excess of allowable values or indicating under- or over-allocation trigger conditional formatting within the section to alert the user to potential data entry issues.

#### 3.3.1.3 Warnings

This table acts as a centralized location for detecting and notifying the user of a range of potential issues in this and other tabs. Cells within the section remain blank unless a potential issue is detected, which causes a warning message to become visible. Each warning message is accompanied by recommendations on potential locations in the workbook for the user to examine.

### 3.3.2 Tab 2 (Input Data Sheet for Basic Data)

This tab provides a location for inputs related to priority water right calls and stream flow measurements. The summary section at the top of the tab aggregates the daily data by month and also provides user

alerts through conditional formatting. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Tables 2a and 2b of Appendix A.

#### 3.3.2.1 Date (Columns 2.1 to 2.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1. Tab R1 also determines if the accounting year is a leap year, allowing this and other tabs to automatically adjust date ranges.

#### 3.3.2.2 Priority Call (Columns 2.4 to 2.6)

The Priority Call section provides a location for input of water right priority calls, with a dropdown selection used to select the most senior GCWA appropriation which would be impacted by the call. This section also allows the input of threshold gage flow rates for temporary suspension of a priority call. Based on prior calls, the threshold rate is assumed to be located at USGS 08116650 (Brazos Rv nr Rosharon, TX). Future priority calls that may use a different gage may require modification to these columns. If the call does not include temporary suspension based on gage flow, then column 2.5 is left blank during the call. The values input in this section are used elsewhere in the workbook to calculate the accessibility of GCWA appropriations. In a basin with a Watermaster, priority calls directly from downstream senior water rights holders are not likely to occur. The term priority call as used in this report and in the accounting plan is therefore also intended to refer to the advance communication of the Watermaster to GCWA that water at a specific priority date is needed downstream to meet a senior need as documented through a Declaration of Intent to Divert.

#### 3.3.2.3 Richmond Gage Flows (Columns 2.7 to 2.9)

This section provides a location for the user to input measured stream flows at USGS 08114000 (Brazos Rv at Richmond, TX). In the event that the flow measurement is missing or erroneous, an override column allows the user to enter a value which supersedes the gage flow value.

#### 3.3.2.4 Rosharon Gage Flows (Columns 2.10 to 2.12)

This section provides a location for the user to input measured stream flows at USGS 08116650 (Brazos Rv nr Rosharon, TX). In the event that the flow measurement is missing or erroneous, an override column allows the user to enter a value which supersedes the gage flow value.

### 3.3.2.5 CoA 12-5322 Bypass Requirement (Columns 2.13 to 2.15)

The Bypass Requirement section includes the Rosharon gage flow requirement included in CoA 12-5322. The base bypass requirement is 15 cfs for the months of April through August and 5 cfs for the remainder of the year. In the event that conditions necessitate an alternate flow requirement value to protect downstream senior rights as described in CoA 12-5322, an override column allows the user to enter an alternate limit which supersedes the default value.

### 3.3.3 Tabs 3, 4, and 5 (Input Data Sheets for Diversion Locations)

Tabs 3, 4, and 5 serve as the location for input of diversions from each of GCWA's Brazos River diversion locations as well as assignment of this volume to GCWA water rights or other sources accessible by GCWA. These tabs also provide indicators of when a certain portion of a GCWA water right is inaccessible due to a priority call, lack of remaining availability, or other factors. The summary section at the top of the tab aggregates results to a monthly level and also provides user alerts through conditional formatting. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Tables 3-5a and 3-5b of Appendix A. Because the same section and column layout is used for each of the three tabs, location and tab identifiers are shown below with "X".

#### 3.3.3.1 Date (Columns X.1 to X.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1.

#### 3.3.3.2 GCWA Diversions at Location X (Columns X.4 to X.9)

The GCWA Diversions section serves as the location for input of metered diversions for each diversion location. In the event that the flow measurement is missing or erroneous, override columns for passive flow-through during large flow events or other causes allows the user to enter a value which supersedes the metered diversion value. Only one of these overrides should be used on a given day. If more than one column is used, column X.7 will indicate an error. This section also tracks the amount of the daily diversion that has not yet been assigned against a GCWA water right or another source.

#### 3.3.3.3 GCWA Diversion Allocations at Location X (Columns X.10 to X.23)

The Diversion Allocations section allows the user to assign the diversion from each location against GCWA's water right appropriations and other sources from the Brazos River. For each



GCWA right and priority date in the daily entries, there is a paired column providing a Y/N indicator to notify the user if assignment to that water right portion is allowable on a particular day. These flags are set using logic on Tab 8 which tracks cumulative use, maximum diversion rates, CoA 12-5322 gage flow requirements, right-specific bypass requirements, and for Location A compliance with SB3 environmental flow standards referencing the Richmond gage. This logic is dynamic, so entering a number which exceeds a limiting parameter will automatically change the flag and trigger warnings through conditional formatting. Finally, column X.23 allows the user to manually assign part or all of the diversions to contractual supply sources.

### 3.3.4 Tab 6 (Summary of Diversions by Source and Location)

Tab 6 summarizes monthly diversions by CoA and diversion location, as well as diversions assigned against other sources. Values in the tab are primarily derived from the user entries on Tabs 3, 4, and 5. Tab 6 is not used for data entry. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Table 6 of Appendix A.

#### 3.3.4.1 Date (Column 6.1)

The Date section establishes date information for the tab.

#### 3.3.4.2 CA 5168 Diversions (Columns 6.2 to 6.5)

This section summarizes monthly diversions assigned to CoA 12-5168 from each take point and in total.

#### 3.3.4.3 CA 5322 Diversions (Columns 6.6 to 6.9)

This section summarizes monthly diversions assigned to CoA 12-5322 from each take point and in total.

#### 3.3.4.4 CA 5171 Diversions (Columns 6.10 to 6.13)

This section summarizes monthly diversions assigned to CoA 12-5171 from each take point and in total.

#### 3.3.4.5 CoA Diversions (Columns 6.14 to 6.17)

This section summarizes total GCWA water right diversions by location and month.

#### 3.3.4.6 Other Diversions (Columns 6.18 to 6.21)

The Other Diversions sections summarize diversions by diversion location and month for sources other than GCWA Brazos River water rights.

### 3.3.5 Tab 7 (Water Rights Reporting)

Tab 7 presents the information from Tab 6 in a more condensed form, eliminating the diversion by location. Tab 7 is not used for data entry. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Table 7 of Appendix A.

#### 3.3.5.1 Date (Column 7.1)

The Date section establishes date information for the tab.

#### 3.3.5.2 GCWA Water Rights (Columns 7.2 to 7.5)

This section summarizes diversions by month for each GCWA Brazos River water right. Values are primarily linked from Tab 6.

### 3.3.6 Tab 8 (Daily Computations for Run-of-River Rights)

Tab 8 is the primary location for calculations related to GCWA run-of-river water right accessibility, including tracking of cumulative and remaining supplies by right and priority and other factors which could impact daily accessibility of an authorization, including priority calls, permitted diversion rates, and environmental flows. The calculations on this tab are referenced by the summary and warning tables on Tab 1 as well as the accessibility flags on Tabs 3–5. Tab 8 is not used for data entry. The summary section at the top of the tab aggregates results by month and also provides user alerts through conditional formatting. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Tables 8a and 8b of Appendix A.

#### 3.3.6.1 Date (Columns 8.1 to 8.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1.

#### 3.3.6.2 GCWA Run-of-River Diversions (Columns 8.4 to 8.9)

The GCWA Run-of-River Diversions section calculates the total daily diversion assigned against each GCWA water right and priority based on the user inputs from Tabs 3, 4, and 5. These

values are used by other sections of the tab in evaluation of cumulative right use and daily accessibility.

#### 3.3.6.3 Priority Call Data (Columns 8.10 to 8.12)

The Priority Call Data section replicates the priority call information from Tab 2. These values are used by other sections of the current tab in evaluation of daily accessibility.

#### 3.3.6.4 Environmental Flow Data and Checks (Columns 8.13 to 8.18)

This section examines compliance with various instream flow parameters. Rosharon gage flows and CoA 12-5322 flow requirements from Tab 2 are compared to determine if flows exceed the threshold each day. A Y/N flag used by other calculations on the tab is generated to flag CoA 12-5322 as not accessible on days where the threshold is not met. There is a calculation to generate a warning flag if diversions are made when the flow condition is not achieved. The section also replicates SB3 flow achievements from Tab 9 to generate a Y/N flag used by other calculations to determine daily accessibility for CoA 12-5322 diversions at Location A based on SB3 standards at the Richmond gage. There is an additional calculation to generate a warning flag if diversions are made when applicable flow conditions for a location are not achieved.

#### 3.3.6.5 Run-of-River Diversion Rate Check (Columns 8.19 to 8.30)

The Diversion Rate Check section converts the daily diversion rate from each water right appropriation listed in the GCWA Run-of-River Diversions section of the tab to an equivalent average daily diversion in cfs. This value is then compared against the permitted maximum diversion rate for that appropriation to generate a Y/N flag used by other calculations on the tab to determine supply accessibility. A similar process was applied for the combined diversion from the three priority appropriations under CoA 12-5322, which have both individual and effectively a combined maximum diversion rate.

#### 3.3.6.6 CoA Tracking and Checks (Columns 8.31 to 8.72)

The CoA Tracking and Checks sections perform cumulative diversion tracking and accessibility checks for each priority appropriation under GCWA's Brazos River water rights. For each of these sections, the following processes are applied:

- Cumulative (year-to-date) diversions are calculated and remaining supplies are calculated by subtracting cumulative diversions from the authorized amount.



- Priority call information is examined to set a Y/N flag indicating whether an appropriation is subject to a senior call. If the priority cutoff is equal or senior to the appropriation and either (a) no call suspension flow rate is in place or (b) flows at the Rosharon gage are below the call suspension flow rate, the flag is set to "Y" to indicate that the appropriation is limited by an active priority call.
- For appropriations under CoA 12-5322, the status flag for achievement of the bypass flow requirement in the permit is replicated from the corresponding section of the tab.
- Diversion rate checks from the preceding section are examined to set a Y/N flag indicating whether an appropriation is within the maximum permitted diversion rate. If the rate checks show that (a) the diversions for the appropriation are within the corresponding maximum and (b) where applicable, all diversions under the water right are within the combined maximum rate, the flag is set to "Y".
- The preceding items in the section are then used to determine a preliminary assessment of accessibility of the priority appropriation and set a Y/N flag. If there is
  - remaining supply,
  - either no applicable priority call or a suspended call,
  - CoA 12-5322 environmental flow rates have been met, and
  - specified diversions are within the permitted rate,

Then the flag is set to "Y". If any of the specified factors are not achieved, the flag is set to "N" to indicate that the priority appropriation is inaccessible. This flag is utilized on Tabs 3, 4, and 5 in conjunction with location-specific factors to set final accessibility indicators on those tabs.

- For priority appropriations under CoA 12-5322, a check is made to determine if the user has entered a diversion when the permitted flow requirement has not been met. This is used to set a Y/N flag utilized elsewhere in the workbook to notify the user of potential data entry issues.

- A check is made to determine if the user has entered a diversion when the appropriation is limited by a priority call. This is used to set a Y/N flag utilized elsewhere in the workbook to notify the user of potential data entry issues.

### 3.3.7 Tabs 9 and 10 (Instream Flow Computations)

Tab 9 tracks attainment of SB3 environmental flow requirements for gaging stations USGS 08114000 (Brazos Rv at Richmond, TX). These tabs are used by other tabs as part of the logic to determine daily water right accessibility for CoA 12-5322 at Location A. Specific sections of Tab 9 are discussed in greater detail below, with details on specific calculations provided in Tables 9a and 9b of Appendix A. Tab 10 provides graphical summaries of flow and SB3 criteria and is therefore not discussed in detail below.

#### 3.3.7.1 Date (Columns 9.1 to 9.3)

The Date section establishes date information for the tab based on the accounting year entered on Tab R1.

#### 3.3.7.2 Season and Condition (Columns 9.4 to 9.7)

The Season and Condition section establishes season and conditions used by calculations in other sections of the tab. Season and season code are based on the date ranges specified in the Title 30, Texas Administrative Code (TAC) §298.455 for the basin. Conditions are calculated from user inputs of seasonal parameters entered by the user on Tab R1.

#### 3.3.7.3 Base Flow (Columns 9.8 to 9.12)

The Base Flow section determines daily base flow target achievement. Gage flows, subsistence flow and base flow criteria are imported from tab R1 and are used to set a daily flow criterion, which varies based on season, climatic condition, and flow. The following procedure is applied to determine the daily criterion:

- If seasonal climatic conditions are in the Dry category:
  - If gage flows are below the subsistence flow, the criterion equals the subsistence flow.

- If gage flows are between the subsistence flow and base flow, the criterion is the subsistence flow plus 50 percent of the difference between gage and subsistence flows.
- If gage flows are above the base flow, the criterion is the base flow.
- For all other seasonal climatic conditions, the daily criterion is the base flow.

The gage flow is then compared against the selected criterion to set a daily achievement flag.

#### 3.3.7.4 Comments (Column 9.13)

This is an optional input column.

### 3.3.8 Tab R1 (General Reference Data)

Tab R1 contains general reference information on water right and contract parameters and unit conversion factors. The Reference tab also provides a location for inputs which do not need to occur at a daily timescale. Information on this tab is utilized extensively by other tabs within the workbook. Specific sections of the tab are discussed in greater detail below, with details on specific calculations provided in Table R1 of Appendix A.

#### 3.3.8.1 Year Reference Data (Columns R1.1 to R1.2)

The Year Reference Data section provides a location for the user to enter the year of the accounting plan. The plan calculates whether or not it is a leap year. Date information and year length on the other tabs are calculated using this reference.

#### 3.3.8.2 Source Reference Data (Columns R1.3 to R1.8)

The Source Reference Data section contains reference data for water sources which GCWA may divert at its three Brazos River diversion points, including source identifier and type, annual allowable volume, priority date, maximum diversion rate, and use type.

#### 3.3.8.3 PHDI Reference Data (Columns R1.9 to R1.12)

The PHDI Reference Data section provides a location for the user to enter seasonal information on climatic conditions, including the Palmer Hydrologic Drought Index (PHDI), along with the corresponding climatic condition code for the lower Brazos River Basin as defined in 30 TAC §298(G).



#### 3.3.8.4 SB3 Parameters for USGS 08114000 Brazos River at Richmond (Columns R1.13 to R1.17)

This section contains SB3 environmental flow factors from the TAC for gaging station USGS 08114000 (Brazos Rv at Richmond, TX). Parameters within this section include base and subsistence flow targets, by season. The contents of the tab are static values referenced by calculations on Tab 9.

#### 3.3.8.5 Conversion Factors (Columns R1.18 to R1.20)

This section lists common unit conversion factors for use by other tabs of the workbook.

#### 3.3.9 Tab R2 (Domains)

This tab contains priority dates for the GCWA water rights, which are used in dropdown list input columns on other tabs.

## Appendix A

### Detailed Calculation Table Summaries

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Appendix A, Table 2a

Column No	Type	Label	Units	Description	Refs
2.1	Ref	Day		Day of year.	
2.2	Ref	Month		Month of year.	
2.3	Ref	Date		Date reference.	R1
2.4	Input	Cutoff Date		Input data. GCWA rights at or junior to the selected date are subject to relevant priority call.	R2
2.5	Input	Call Suspension Flow Rate	cfs	Input data. Flow rate associated with a temporary suspension of a priority call as measured at USGS gage 08116650 (Brazos Rv near Rosharon).	
2.6	Calc	Priority Call Issued?	Y/N	If cutoff date provided [2.4], "Y". Else, "N".	
2.7	Input	Richmond Gage Flow	cfs	Input data. Flow at USGS gage 08114000 (Brazos Rv at Richmond).	
2.8	Input	Richmond Gage Override	cfs	Input data (optional). Overrides flow at USGS gage 08114000 from time series input in [2.7]	
2.9	Calc	Richmond Adjusted Gage Flow	cfs	If gage override provided [2.8], equals [2.8]. Else, equals measured gage flow [2.7].	
2.10	Input	Rosharon Gage Flow	cfs	Input data. Flow at USGS gage 08116650 (Brazos Rv near Rosharon).	
2.11	Input	Rosharon Gage Override	cfs	Input data (optional). Overrides flow at USGS gage 08116650 from time series input in [2.10] in the event of missing or erroneous measurements or other issues.	
2.12	Calc	Rosharon Adjusted Gage Flow	cfs	If gage override provided [2.11], equals [2.11]. Else, equals measured gage flow [2.10].	

Column No	Type	Label	Units	Description	Refs
2.13	Calc	CoA 12-5322 Base Bypass	cfs	Default bypass flow associated with CoA 12-5322. For April through August, equal to 15 cfs. Else, equal to 5 cfs.	
2.14	Input	Alternate Limit	cfs	Input data (optional). User override for base bypass flow.	
2.15	Calc	CoA 12-5322 Adjusted Bypass	cfs	If alternate limit provided [2.14], equals [2.14]. Else, equals base bypass requirement [2.13].	

Appendix A, Table 2b

Column No	Type	Label	Units	Description	Refs
2.1	Ref	Days		Number of days in month.	
2.2	Ref	Month		Month of year.	
2.3	Ref	End Date		End date for given month.	R1
2.4	Input*	# of Days Priority Call Active?	count	Monthly count of days for which a priority call is issued.	
2.5	Input*	Call Suspension Flow Rate	Y/N	If call suspension flow rate (daily) was entered for one or more days in a given month, equals "Y". Else, equals "N".	
2.6	Calc	Priority Call Issued?	Y/N	If priority call was issued for one or more days in a given month, equals "Y". Else, equals "N".	
2.7	Input*	Richmond Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08114000 (Brazos Rv at Richmond).	R1
2.8	Input*	Richmond Gage Override	count	Monthly count of days for which an override flow at gage 08114000 has been applied.	
2.9	Calc	Richmond Adjusted Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08114000 (Brazos Rv at Richmond) after applying override flows.	R1
2.10	Input*	Rosharon Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08116650 (Brazos Rv near Rosharon).	R1
2.11	Input*	Rosharon Gage Override	count	Monthly count of days for which an override flow at gage 08116650 has been applied.	
2.12	Calc	Rosharon Adjusted Gage Flow	ac-ft	Monthly sum of flow at USGS gage 08116650 (Brazos Rv near Rosharon) after applying override flows.	R1



Column No	Type	Label	Units	Description	Refs
2.13	Calc	CoA 12-5322 Base Bypass	ac-ft	Monthly sum of CoA 12-5322 base bypass flows.	R1
2.14	Input*	Alternate Limit	count	Monthly count of days for which an alternate bypass limit has been applied.	
2.15	Calc	CoA 12-5322 Adjusted Bypass	ac-ft	Monthly sum of CoA 12-5322 bypass flows after applying alternate limits.	R1

\*Inputs are entered at the daily level as shown in Appendix A, Table 2a above.

Appendix A, Table 3a, 4a, 5a

Column No	Type	Label	Units	Description	Refs
X.1	Ref	Day		Day of year.	2.1
X.2	Ref	Month		Month of year.	2.2
X.3	Ref	Date		Date reference.	2.3
X.4	Input	Metered Diversions	MG	Input data. Metered diversions at the given take point.	
X.5	Input	Override for Spilling	MG	Input data (optional). Manual entry for diversion at the given take point when high river flows cause flow into a GCWA canal when not pumping for diversion purposes.	
X.6	Input	Other Override	MG	Input data (optional). Manual entry for diversion at the given take point to address other measurement issues.	
X.7	Calc	Override Check	none	If alternate diversion values are entered in both [3.5] and [3.6], equals "ERROR". Else, cell is blank.	
X.8	Calc	Diversions	ac-ft	If alternate diversion value entered in either [3.5] or [3.6], equal to [3.5] or [3.6]. Else, equal to [3.4].	R1
X.9	Calc	Unassigned Flow	ac-ft	Diversions which have not been assigned either to ROR water rights or other sources. Equal to [3.8] less the sum of [3.22] and [3.23].	
X.10	Input	CoA 5322 (1983)	ac-ft	Input data. Assignment of diversion to CoA 12-5322 under 1983 priority date.	
X.11	Calc	Avail.	Y/N	If supply is available ([8.36] is "Y") and, for Location A, if Richmond gage flow meets base criteria ([8.17] is "Y"), equal "Y". Else, equal "N".	8.17*, 8.36
X.12	Input	CoA 5322 (1955)	ac-ft	Input data. Assignment of diversion to CoA 12-5322 under 1955 priority date.	

Column No	Type	Label	Units	Description	Refs
X.13	Calc	Avail.	Y/N	If supply is available ([8.44] is "Y") and, for Location A, if Richmond gage flow meets base criteria ([8.17] is "Y"), equal "Y". Else, equal "N".	8.17*, 8.44
X.14	Input	CoA 5171 (1950)	ac-ft	Input data. Assignment of diversion to CoA 12-5171 under 1950 priority date.	
X.15	Calc	Avail.	Y/N	Repeated from Table 8.	8.51
X.16	Input	CoA 5171 (1939)	ac-ft	Input data. Assignment of diversion to CoA 12-5171 under 1939 priority date.	
X.17	Calc	Avail.	Y/N	Repeated from Table 8.	8.57
X.18	Input	CoA 5322 (1929)	ac-ft	Input data. Assignment of diversion to CoA 12-5322 under 1929 priority date.	
X.19	Calc	Avail.	Y/N	If supply is available ([8.64] is "Y") and, for Location A, if Richmond gage flow meets base criteria ([8.17] is "Y"), equal "Y". Else, equal "N".	8.17*, 8.64
X.20	Input	CoA 5168 (1926)	ac-ft	Input data. Assignment of diversion to CoA 12-5168 under 1926 priority date.	
X.21	Calc	Avail.	Y/N	Repeated from Table 8.	8.71
X.22	Calc	Total ROR Diversions	ac-ft	Sum of [3.10], [3.12], [3.14], [3.16], [3.18], and [3.20].	
X.23	Input	Total Contract Diversions	ac-ft	Input data. Manual assignment of diversion to BRA contract.	

The above parameters are entered for Location A (Shannon pump station) in Table 3, for Location B (Briscoe pump station) in Table 4, and for Location J (May pump station) in Table 5.

\* [8.17] checks whether environmental flow conditions have been met at the Richmond gage; this reference is only applicable in Table 3 (Shannon pump station).



Appendix A, Table 3b, 4b, 5b

Column No	Type	Label	Units	Description	Refs
X.1	Ref	Days		Number of days in month.	
X.2	Ref	Month		Month of year.	
X.3	Ref	End Date		End date for given month.	R1
X.4	Input*	Metered Diversions	ac-ft	Monthly sum of metered diversions at the given take point.	
X.5	Input*	Override for Spilling	count	Monthly count of days for which an override for spilling has been applied.	
X.6	Input*	Other Override	count	Monthly count of days for which a non-spilling override has been applied.	
X.7	Calc	Override Errors?	count	Monthly count of days for which two different diversion overrides were input.	
X.8	Calc	Diversions	ac-ft	Monthly sum of diversions at the given take point, after inclusion of alternate diversion amounts.	
X.9	Calc	Unassigned Flow	ac-ft	Monthly sum of diversions which have not been assigned to either ROR rights or BRA contracts.	
X.10	Input*	CoA 5322 (1983)	ac-ft	Monthly sum of diversion allocations to CoA 12-5322 under 1983 priority date.	
X.11	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.12	Input*	CoA 5322 (1955)	ac-ft	Monthly sum of diversion allocations to CoA 12-5322 under 1955 priority date.	
X.13	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	

Column No	Type	Label	Units	Description	Refs
X.14	Input*	CoA 5171 (1950)	ac-ft	Monthly sum of diversion allocations to CoA 12-5171 under 1950 priority date.	
X.15	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.16	Input*	CoA 5171 (1939)	ac-ft	Monthly sum of diversion allocations to CoA 12-5171 under 1939 priority date.	
X.17	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.18	Input*	CoA 5322 (1929)	ac-ft	Monthly sum of diversion allocations to CoA 12-5322 under 1929 priority date.	
X.19	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.20	Input*	CoA 5168 (1926)	ac-ft	Monthly sum of diversion allocations to CoA 12-5168 under 1926 priority date.	
X.21	Calc	Avail.	Y/N	Not applicable on a monthly timescale.	
X.22	Calc	Total ROR Diversions	ac-ft	Monthly sum of all diversions allocated to CoA 12-5322, CoA 12-5171, and CoA 12-5168.	
X.23	Input*	Total Contract Diversions	ac-ft	Monthly sum of diversion allocations to BRA contracts.	

*The above parameters are entered for Location A (Shannon pump station) in Table 3, for Location B (Briscoe pump station) in Table 4, and for Location J (May pump station) in Table 5.*

*\* Inputs are entered at the daily level as shown in Appendix A, Table 3A, 4A, 5A above.*

Appendix A, Table 6

Column No	Type	Section	Label	Units	Description	Refs
6.1	Ref		Month		Date reference.	
6.2	Calc	CA 5168 Diversions	Location A	ac-ft	Diversions under CoA 12-5168 at diversion location A. Repeated from Table 3.	3.20
6.3	Calc		Location B	ac-ft	Diversions under CoA 12-5168 at diversion location B. Repeated from Table 4.	4.20
6.4	Calc		Location J	ac-ft	Diversions under CoA 12-5168 at diversion location J. Repeated from Table 5.	5.20
6.5	Calc		Total Diversions	ac-ft	Total diversions under CoA 12-5168. Sum of [6.2], [6.3], and [6.4].	
6.6	Calc	CA 5322 Diversions	Location A	ac-ft	Diversions under CoA 12-5322 at diversion location A. Sum of [3.10], [3.12], and [3.18].	3.10, 3.12, 3.18
6.7	Calc		Location B	ac-ft	Diversions under CoA 12-5322 at diversion location B. Sum of [4.10], [4.12], and [4.18].	4.10, 4.12, 4.18
6.8	Calc		Location J	ac-ft	Diversions under CoA 12-5322 at diversion location J. Sum of [5.10], [5.12], and [5.18].	5.10, 5.12, 5.18
6.9	Calc		Total Diversions	ac-ft	Total diversions under CoA 12-5322. Sum of [6.6], [6.7], and [6.8].	
6.10	Calc	CA 5171 Diversions	Location A	ac-ft	Diversions under CoA 12-5171 at diversion location A. Sum of [3.14] and [3.16].	3.14, 3.16
6.11	Calc		Location B	ac-ft	Diversions under CoA 12-5171 at diversion location A. Sum of [4.14] and [4.16].	4.14, 4.16
6.12	Calc		Location J	ac-ft	Diversions under CoA 12-5171 at diversion location J. Sum of [5.14] and [5.16].	5.14, 5.16
6.13	Calc		Total Diversions	ac-ft	Total diversions under CoA 12-5171. Sum of [6.10], [6.11], and [6.12].	



Column No	Type	Section	Label	Units	Description	Refs
6.14	Calc	GCWA Water Right Diversions	Location A	ac-ft	Total GCWA water right diversions from location A. Sum of [6.2], [6.6], and [6.10].	
6.15	Calc		Location B	ac-ft	Total GCWA water right diversions from location B. Sum of [6.3], [6.7], and [6.11].	
6.16	Calc		Location J	ac-ft	Total GCWA water right diversions from location J. Sum of [6.4], [6.8], and [6.12].	
6.17	Calc		Total Diversions	ac-ft	Total GCWA water right diversions. Sum of [6.14], [6.15], and [6.16].	
6.18	Calc	Other Diversions	Location A	ac-ft	Supply contract water diverted at Location A. Repeated from Table 3.	3.23
6.19	Calc		Location B	ac-ft	Supply contract water diverted at Location B. Repeated from Table 4.	4.23
6.20	Calc		Location J	ac-ft	Supply contract water diverted at Location J. Repeated from Table 5.	5.23
6.21	Calc		Total Diversions	ac-ft	Total supply contract water diverted. Sum of [6.18], [6.19], and [6.20].	

**Appendix A, Table 7**

Column No	Type	Label	Units	Description	Refs
7.1	Ref	Month		Date reference.	
7.2	Calc	CA 5168	ac-ft	Total diversions under CoA 12-5168. Repeated from Table 6.	6.5
7.3	Calc	CA 5322	ac-ft	Total diversions under CoA 12-5322. Repeated from Table 6.	6.9
7.4	Calc	CA 5171	ac-ft	Total diversions under CoA 12-5171. Repeated from Table 6.	6.13
7.5	Calc	Total	ac-ft	Sum of [7.2], [7.3], and [7.4].	

Appendix A, Table 8a

Column No	Type	Permit	Label	Units	Description	Refs
8.1	Ref		Day		Day of year.	2.1
8.2	Ref		Month		Month of year.	2.2
8.3	Ref		Date		Date reference.	2.3
8.4	Calc		CoA 5322 (1983)	ac-ft	Sum of CoA 12-5322 (1983 priority) diversions from Locations A [3.10], B [4.10], and C [5.10].	3.10, 4.10, 5.10
8.5	Calc		CoA 5322 (1955)	ac-ft	Sum of CoA 12-5322 (1955 priority) diversions from Locations A [3.12], B [4.12], and C [5.12].	3.12, 4.12, 5.12
8.6	Calc		CoA 5171 (1950)	ac-ft	Sum of CoA 12-5171 (1950 priority) diversions from Locations A [3.14], B [4.14], and C [5.14].	3.14, 4.14, 5.14
8.7	Calc		CoA 5171 (1939)	ac-ft	Sum of CoA 12-5171 (1939 priority) diversions from Locations A [3.16], B [4.16], and C [5.16].	3.16, 4.16, 5.16
8.8	Calc		CoA 5322 (1929)	ac-ft	Sum of CoA 12-5322 (1929 priority) diversions from Locations A [3.18], B [4.18], and C [5.18].	3.18, 4.18, 5.18
8.9	Calc		CoA 5168 (1926)	ac-ft	Sum of CoA 12-5168 (1926 priority) diversions from Locations A [3.20], B [4.20], and C [5.20].	3.20, 4.20, 5.20
8.10	Calc		Cutoff Date	Date	Rights at or junior to the selected date are subject to relevant priority call. Repeated from Table 2.	2.4
8.11	Calc		Call Suspension Flow Rate	cfs	Flow rate associated with a temporary suspension of a priority call as measured at USGS gage 08116650 (Brazos Rv near Rosharon). Repeated from Table 2.	2.5
8.12	Calc		Priority Call Issued?	Y/N	Repeated from Table 2.	2.6



Column No	Type	Permit	Label	Units	Description	Refs
8.13	Calc		Rosharon Adjusted Gage Flow	cfs	Flow at USGS gage 08114000 (Brazos Rv at Richmond) after any manual adjustment for missing or erroneous readings. Repeated from Table 2.	2.12
8.14	Calc		CoA 12-5322 Adjusted Bypass	cfs	Bypass flow associated with CoA 12-5322. Repeated from Table 2.	2.15
8.15	Calc		CoA 12-5322 Bypass Met?	Y/N	If Rosharon gage flow [8.13] exceeds CoA 12-5322 bypass flow [8.14], equals "Y". Else, equals "N".	
8.16	Calc		CoA 12-5322 Bypass Flag?	Y/N	If CoA 12-5322 bypass is not met ([8.15] is "N") and any diversions are allocated to CoA 12-5322 on that day ([8.4], [8.5], or [8.8] are greater than zero), equal to "Y". Else, equals "N".	
8.17	Calc		Richmond Eflows Met?	Y/N	If Richmond gage flow meets or exceeds base criteria ([9.12] is "TRUE"), "Y". Else, "N".	9.12
8.18	Calc		Richmond Eflow Flag?	Y/N	If instream flows are not met ([8.17] is "N") and any diversions are allocated to CoA 12-5322 at Location A on that day ([3.10], [3.12], or [3.18]), equals "Y". Else, equals "N".	3.10, 3.12, 3.18
8.19	Calc		5322 (1983) Rate	cfs	Conversion of [8.4] to cfs.	R1
8.20	Calc		Exceeds Limit?	Y/N	If [8.19] exceeds permitted rate, "Y". Else, "N".	R1
8.21	Calc		5322 (1955) Rate	cfs	Conversion of [8.5] to cfs.	R1
8.22	Calc		Exceeds Limit?	Y/N	If [8.21] exceeds permitted rate, "Y". Else, "N".	R1
8.23	Calc		5322 (1929) Rate	cfs	Conversion of [8.8] to cfs.	R1

Column No	Type	Permit	Label	Units	Description	Refs
8.24	Calc		Exceeds Limit?	Y/N	If [8.23] exceeds permitted rate, "Y". Else, "N".	R1
8.25	Calc		5322 Combined Rate	cfs	Sum of [8.4], [8.5], and [8.8], converted to cfs.	R1
8.26	Calc		Exceeds Limit?	Y/N	If [8.25] exceeds permitted rate, "Y". Else, "N".	R1
8.27	Calc		5171 Combined Rate	cfs	Sum of [8.6] and [8.7], converted to cfs.	R1
8.28	Calc		Exceeds Limit?	Y/N	If [8.27] exceeds permitted rate, "Y". Else, "N".	R1
8.29	Calc		5168 Rate	cfs	Conversion of [8.9] to cfs.	R1
8.30	Calc		Exceeds Limit?	Y/N	If [8.29] exceeds permitted rate, "Yes". Else, "No".	R1
8.31	Calc	CoA 5322 (1983)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5322 (1983 priority) in [8.4].	
8.32	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.31].	R1
8.33	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date is senior or equal to 1983 priority date, "Y". Else, "N".	R1
8.34	Calc		CoA 12-5322 Bypass Met?	Y/N	Repeated from [8.15].	
8.35	Calc		Within Rate?	Y/N	If [8.20] and [8.26] are both "N", equal "Y". Else, equal "N".	

Column No	Type	Permit	Label	Units	Description	Refs
8.36	Calc	CoA 5322 (1983)	Available Supply?	Y/N	If no priority call ([8.33] is "N"), bypass is met ([8.34] is "Y"), diversion is within rate ([8.35] is "Y") and either present-day or previous-day remaining supply [8.32] is greater than zero, equal "Y". Else, "N".	
8.37	Calc		CoA 12-5322 Bypass Flag?	Y/N	If diversion [8.4] is greater than zero and bypass is not met ([8.34] is "N"), then equals "Y". Else, equals "N".	
8.38	Calc		Priority Flag?	Y/N	If diversion [8.4] is greater than zero and non-suspended priority call has been issued ([8.33] is "Y"), then equals "Y". Else, equals "N".	
8.39	Calc	CoA 5322 (1955)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5322 (1955 priority) in [8.5].	
8.40	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.39].	R1
8.41	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date is senior or equal to the 1955 priority date, "Y". Else, "N".	R1
8.42	Calc		CoA 12-5322 Bypass Met?	Y/N	Repeated from [8.15].	
8.43	Calc		Within Rate?	Y/N	If [8.22] and [8.26] are both "N", equal "Y". Else, equal "N".	
8.44	Calc		Available Supply?	Y/N	If no priority call ([8.41] is "N"), bypass is met ([8.42] is "Y"), diversion is within rate ([8.43] is "Y") and either present-day or previous-day remaining supply [8.40] is greater than zero, equal "Y". Else, "N".	
8.45	Calc		CoA 12-5322 Bypass Flag?	Y/N	If diversion [8.5] is greater than zero and bypass is not met ([8.42] is "N"), then equals "Y". Else, equals "N".	
8.46	Calc		Priority Flag?	Y/N	If diversion [8.5] is greater than zero and non-suspended priority call has been issued ([8.41] is "Y"), then equals "Y". Else, equals "N".	



Column No	Type	Permit	Label	Units	Description	Refs
8.47	Calc	CoA 5171 (1950)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5171 (1950 priority) in [8.6].	
8.48	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.47].	R1
8.49	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date is senior or equal to the 1950 priority date, "Y". Else, "N".	R1
8.50	Calc		Within Rate?	Y/N	If [8.28] is "N", equal "Y". Else, equal "N".	
8.51	Calc		Available Supply?	Y/N	If no priority call ([8.49] is "N"), diversion is within rate ([8.50] is "Y") and either present-day or previous-day remaining supply [8.48] is greater than zero, equal "Y". Else, "N".	
8.52	Calc	CoA 5171 (1939)	Priority Flag?	Y/N	If diversion [8.6] is greater than zero and priority call has been issued ([8.49] is "Y"), then equals "Y". Else, equals "N".	
8.53	Calc		Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5171 (1939 priority) in [8.7].	
8.54	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.53].	R1
8.55	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date is senior or equal to the 1939 priority date, "Y". Else, "N".	R1
8.56	Calc		Within Rate?	Y/N	If [8.28] is "N", equal "Y". Else, equal "N".	
8.57	Calc		Available Supply?	Y/N	If no priority call ([8.55] is "N"), diversion is within rate ([8.56] is "Y") and either present-day or previous-day remaining supply [8.54] is greater than zero, equal "Y". Else, "N".	

Column No	Type	Permit	Label	Units	Description	Refs
8.58	Calc	CoA 5171 (1939)	Priority Flag?	Y/N	If diversion [8.7] is greater than zero and non-suspended priority call has been issued ([8.55] is "Y"), then equals "Y". Else, equals "N".	
8.59	Calc	CoA 5322 (1929)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5322 (1929 priority) in [8.8].	
8.60	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.59].	R1
8.61	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date is senior or equal to the 1929 priority date, "Y". Else, "N".	R1
8.62	Calc		CoA 12-5322 Bypass Met?	Y/N	Repeated from [8.15].	
8.63	Calc		Within Rate?	Y/N	If [8.24] and [8.26] are both "N", equal "Y". Else, equal "N".	
8.64	Calc		Available Supply?	Y/N	If no priority call ([8.61] is "N"), bypass is met ([8.62] is "Y"), diversion is within rate ([8.63] is "Y") and either present-day or previous-day remaining supply [8.60] is greater than zero, equal "Y". Else, "N".	
8.65	Calc		CoA 12-5322 Bypass Flag?	Y/N	If diversion [8.8] is greater than zero and bypass is not met ([8.62] is "N"), the equals "Y". Else, equals "N".	
8.66	Calc		Priority Flag?	Y/N	If diversion [8.8] is greater than zero and non-suspended priority call has been issued ([8.61] is "Y"), then equals "Y". Else, equals "N".	

Column No	Type	Permit	Label	Units	Description	Refs
8.67	Calc	CoA 5168 (1926)	Cumulative Diversions	ac-ft	Cumulative total of diversions under CoA 12-5168 (1926 priority) in [8.9].	
8.68	Calc		Remaining Supply	ac-ft	Equal to permitted appropriation [R1.5] less cumulative diversions [8.67].	R1
8.69	Calc		Priority Call On?	Y/N	If Rosharon gage flow [8.13] is less than call suspension flow rate [8.11] and priority call cutoff date is senior or equal to the 1926 priority date, "Y". Else, "N".	R1
8.70	Calc		Within Rate?	Y/N	If [8.30] is "N", equal "Y". Else, equal "N".	
8.71	Calc		Available Supply?	Y/N	If no priority call ([8.69] is "N"), diversion is within rate ([8.70] is "Y") and either present-day or previous-day remaining supply [8.68] is greater than zero, equal "Y". Else, "N".	
8.72	Calc		Priority Flag?	Y/N	If diversion [8.9] is greater than zero and non-suspended priority call has been issued ([8.69] is "Y"), then equals "Y". Else, equals "N".	



Appendix A, Table 8b

Column No	Type	Permit	Label	Units	Description	Refs
8.1	Ref		Days		Number of days in month.	
8.2	Ref		Month		Month of year.	
8.3	Ref		End Date		End date for given month.	2.3
8.4	Calc		CoA 5322 (1983)	ac-ft	Monthly sum of diversions allocated to CoA 12-5322 (1938).	
8.5	Calc		CoA 5322 (1955)	ac-ft	Monthly sum of diversions allocated to CoA 12-5322 (1955).	
8.6	Calc		CoA 5171 (1950)	ac-ft	Monthly sum of diversions allocated to CoA 12-5171 (1950).	
8.7	Calc		CoA 5171 (1939)	ac-ft	Monthly sum of diversions allocated to CoA 12-5171 (1939).	
8.8	Calc		CoA 5322 (1929)	ac-ft	Monthly sum of diversions allocated to CoA 12-5322 (1929).	
8.9	Calc		CoA 5168 (1926)	ac-ft	Monthly sum of diversions allocated to CoA 12-5168 (1926).	
8.10	Calc		# of Days Priority Call Active?	count	Monthly count of days for which a priority cutoff date has been applied.	
8.11	Calc		Call Suspension Flow Rate	Y/N	On a monthly basis, if one or more call suspension flow rates have been applied, "Y". Else, "N".	
8.12	Calc		Priority Call Issued?	Y/N	On a monthly basis, if one or more priority calls have been issued, "Y". Else, "N".	

Column No	Type	Permit	Label	Units	Description	Refs
8.13	Calc		Rosharon Adjusted Gage Flow	ac-ft	Monthly sum of flow past USGS gage 08116650 (Brazos Rv near Rosharon), converted to ac-ft.	R1
8.14	Calc		CoA 12-5322 Adjusted Bypass	ac-ft	Monthly sum of bypass flows, converted to ac-ft.	R1
8.15	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days for which required bypass flow was met.	
8.16	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.17	Calc		Richmond Eflows Met?	count	Monthly count of days for which instream flows at USGS gage 08114000 (Brazos Rv at Richmond) were met.	
8.18	Calc		Richmond Eflow Flag?	count	On a monthly basis, if one or more instream flow flags were triggered, equal "Y". Else, "N".	
8.19	Calc		5322 (1983) Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (1983).	
8.20	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 (1983) on one or more days, "Y". Else, "N".	
8.21	Calc		5322 (1955) Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (1955).	
8.22	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 (1955) on one or more days, "Y". Else, "N".	
8.23	Calc		5322 (1929) Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (1929).	
8.24	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 (1929) on one or more days, "Y". Else, "N".	
8.25	Calc		5322 Combined Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5322 (total).	

Column No	Type	Permit	Label	Units	Description	Refs
8.26	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5322 on one or more days, "Y". Else, "N".	
8.27	Calc		5171 Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5171.	
8.28	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5171 on one or more days, "Y". Else, "N".	
8.29	Calc		5168 Max Rate	cfs	Monthly maximum flow allocated to CoA 12-5168.	
8.30	Calc		Exceeds Limit?	Y/N	On a monthly basis, if maximum flow exceeded permitted limit for CoA 12-5168 on one or more days, "Y". Else, "N".	
8.31	Calc	CoA 5322 (1983)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5322 (1983).	
8.32	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5322 (1983).	
8.33	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5322 (1983), "Y". Else, "N".	
8.34	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days on which the bypass flow for CoA 12-5322 has been met.	
8.35	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.35] in daily table is "N"), equal "N". Else, equal "Y".	
8.36	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5322 (1983).	
8.37	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.38	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5322 (1983) while under a priority call.	



Column No	Type	Permit	Label	Units	Description	Refs
8.39	Calc	CoA 5322 (1955)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5322 (1955).	
8.40	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5322 (1955).	
8.41	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5322 (1955), "Y". Else, "N".	
8.42	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days on which the bypass flow for CoA 12-5322 has been met.	
8.43	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.35] in daily table is "N"), equal "N". Else, equal "Y".	
8.44	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5322 (1955).	
8.45	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.46	Calc	CoA 5171 (1950)	Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5322 (1955) while under a priority call.	
8.47	Calc		Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5171 (1950).	
8.48	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5171 (1950).	
8.49	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5171 (1950), "Y". Else, "N".	
8.50	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.35] in daily table is "N"), equal "N". Else, equal "Y".	

Column No	Type	Permit	Label	Units	Description	Refs
8.51	Calc	CoA 5171 (1950)	Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5171 (1950).	
8.52	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5171 (1950) while under a priority call.	
8.53	Calc	CoA 5171 (1939)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5171 (1939).	
8.54	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5171 (1939).	
8.55	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5171 (1939), "Y". Else, "N".	
8.56	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.35] in daily table is "N"), equal "N". Else, equal "Y".	
8.57	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5171 (1939).	
8.58	Calc	CoA 5322 (1929)	Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5171 (1939) while under a priority call.	
8.59	Calc		Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5322 (1929).	
8.60	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5322 (1929).	
8.61	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5322 (1929), "Y". Else, "N".	
8.62	Calc		CoA 12-5322 Bypass Met?	count	Monthly count of days on which the bypass flow for CoA 12-5322 has been met.	

Column No	Type	Permit	Label	Units	Description	Refs
8.63	Calc	CoA 5322 (1929)	Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.35] in daily table is "N"), equal "N". Else, equal "Y".	
8.64	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5322 (1929).	
8.65	Calc		CoA 12-5322 Bypass Flag?	Y/N	On a monthly basis, if one or more bypass flags were triggered, equal "Y". Else, "N".	
8.66	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5322 (1929) while under a priority call.	
8.67	Calc	CoA 5168 (1926)	Cumulative Diversions	ac-ft	End-of-month cumulative diversions under CoA 12-5168 (1926).	
8.68	Calc		Remaining Supply	ac-ft	End-of-month remaining permitted amount under CoA 12-5168 (1926).	
8.69	Calc		Priority Call On?	Y/N	If one or more priority calls have been issued in a given month for CoA 12-5168 (1926), "Y". Else, "N".	
8.70	Calc		Within Rate?	Y/N	If diversion for one or more days in a given month exceeds permitted rate ([8.35] in daily table is "N"), equal "N". Else, equal "Y".	
8.71	Calc		Available Supply?	count	Monthly count of days for which supply is available under CoA 12-5168 (1926).	
8.72	Calc		Priority Flag?	Y/N	Monthly count of days in which flow was allocated to CoA 12-5168 (1926) while under a priority call.	



Appendix A, Table 9a

Column No	Type	Label	Units	Description	Refs
9.1	Ref	Day		Day of year.	2.1
9.2	Ref	Month		Month of year.	2.2
9.3	Ref	Date		Date reference.	2.3
9.4	Calc	Season	ref	Season for month [9.2], as defined in 30 TAC 298(G).	
9.5	Calc	Season Code	ref	Numeric code corresponding to season [9.4].	
9.6	Calc	Condition Code - Lower Basin	ref	Lower basin condition code [R1.11] corresponding to season in [9.4].	R1
9.7	Calc	Condition - Lower Basin	ref	Lower basin condition [R1.12] corresponding to season in [9.4].	R1
9.8	Calc	USGS 08114000 Brazos Rv at Richmond	cfs	Flows for USGS gage 08114000 (Brazos Rv at Richmond). Repeated from Table 2.	2.9
9.9	Calc	Subsistence Flow Criteria	cfs	Subsistence flow rate for current season.	R1
9.10	Calc	Base Flow Criteria	cfs	Baseflow for current season and climatic condition.	R1
9.11	Calc	Base Criteria Series	cfs	If climatic condition [9.6] is dry and gage flow [9.8] below subsistence criterion [9.9], equals [9.9]. If condition is dry and gage flow is between subsistence flow [9.9] and base flow [9.10], equals [9.9] plus half of difference between [9.8] and [9.9]. Else, equals [9.10].	
9.12	Calc	Meets Base Criteria?	T/F	If gage flow [9.8] greater than base criteria [9.11], "True". Else, "False".	
9.13	Input	Comments	none	Optional input for comments.	

Appendix A, Table 9b

Column No	Type	Label	Units	Description	Refs
9.1	Ref	Days		Number of days in month.	
9.2	Ref	Month		Month of year.	
9.3	Ref	End Date		End date for given month.	R1
9.4	Calc	Season	ref	Season corresponding to month of year, as defined in 30 TAC 298(G).	
9.5	Calc	Season Code	ref	Static season code value corresponding to [9.4].	
9.6	Calc	Condition Code - Lower Basin	ref	Lower basin condition code [R1.11] corresponding to season in [9.4].	R1
9.7	Calc	Condition - Lower Basin	ref	Lower basin condition [R1.12] corresponding to season in [9.4].	R1
9.8	Calc	Average Flow	cfs	Monthly average of flow at USGS gage 08114000 (Brazos Rv at Richmond).	
9.9	Calc	Subsistence Flow Criteria	cfs	Subsistence flow rate for given season [9.5].	R1
9.10	Calc	Base Flow Criteria	cfs	Baseflow for season [9.5] and climatic condition [9.6].	R1
9.11	Calc	Base Criteria Series (Average)	cfs	Monthly average of base criteria flow.	
9.12	Calc	Number of Days Meeting Base Series Criteria	count	Monthly count of days for which flow at Richmond gage meets base criteria.	
9.13	Input	Comments	none	Optional input for comments.	

Appendix A, Table R1

Column No	Type	Section	Label	Units	Description	Refs
R1.1	Ref	Year	Parameter		Row descriptor "Year" or "Leap Year".	
R1.2	Input /Calc		Value		Data entry cell for year of accounting plan and calculation cell to determine whether input year is a leap year.	
R1.3	Ref	Source Reference Data	Source		Contract or water right name of GCWA supply sources.	
R1.4	Ref		Type		Type of source.	
R1.5	Ref		Amount	ac-ft	Annual permitted volume.	
R1.6	Ref		Priority		Priority date associated with source.	
R1.7	Ref		Max Combined Rate	cfs	Maximum diversion rate associated with source.	
R1.8	Ref	PHDI Reference Data	Use Type		Permitted use type associated with source.	
R1.9	Ref		Season		Season name.	
R1.10	Input		Lower Basin PHDI		Palmer Hydrological Drought Index value on the last day of the month of the preceding season.	
R1.11	Input		Lower Basin Condition Code		Numeric code for condition based on PHDI [R1.10] value.	
R1.12	Input		Lower Basin Condition		Descriptive climatic condition based on PHDI [R1.10] value. Either "Dry", "Average", or "Wet".	



Column No	Type	Section	Label	Units	Description	Refs
R1.13	Ref	SB3 Parameters	Hydrologic Condition		Reference column for subsistence flows and base flows for dry, average, or wet climatic conditions.	
R1.14	Ref		Condition Code		Numeric code for conditions.	
R1.15	Ref		Winter	cfs	Subsistence and base flow standards during November through February, inclusive.	
R1.16	Ref		Spring	cfs	Subsistence and base flow standards during March through June, inclusive.	
R1.17	Ref		Summer	cfs	Subsistence and base flow standards during July through October, inclusive.	
R1.18	Ref	Conversion Factors	To get:		Unit of output value for unit conversion operations.	
R1.19	Ref		From:		Unit of original value for unit conversion operations.	
R1.20	Ref		Multiply by:		Unit conversion factor to be multiplied by original value.	

**Gulf Coast Water Authority ADJ No. 12-5322G**

**January 8, 2018**

Accounting Plan with text file available upon request

**Blank Data**

Contact Mr. Chris Kozlowski at (512) 239-1801

**Gulf Coast Water Authority ADJ No. 12-5322G**

**January 8, 2018**

Accounting Plan with text file available upon request

**Synthetic Test Data**

Contact Mr. Chris Kozlowski at (512) 239-1801



## **Attachment 11**

Irrigation Language Applicant Requests Be Removed

## **Section 1 – Overview**

The language of the Certificates of Adjudication (CA) for GCWA's three Brazos River rights includes reference to specific acreage and locations associated with irrigation use of the rights. These conditions are a legacy of the original nature of the rights when first granted and no longer align with the current use of the rights as wholesale supplies. GCWA, as a wholesale water supplier serving multiple water demand types over a broad geographic area, is not itself an agricultural producer and does not directly control the acreage irrigated by its agricultural customers. Continued inclusion of acreage and location restrictions on GCWA's Brazos River water rights could therefore inadvertently limit operational flexibility. For these reasons, the proposed amendments to CA 12-5168, 12-5171, and 12-5322 include a request that such language be rendered inapplicable to the rights. Relevant clauses of the existing authorizations, as amended, are discussed in the following section and attached as a part of this appendix with relevant text noted with a red border. Please note that this appendix references the first occurrences of the relevant restrictions for each water right and does not include a summary of repetition of the restrictions in "whereas" clauses or other locations of subsequent amendments. However, GCWA proposes that the restrictions discussed below be fully rendered inapplicable to the water rights.

## **Section 2 – Certificate of Adjudication 12-5168**

CA 12-5168 includes, in Paragraph 2(B), language that the authorization may be used to irrigate "*a maximum of 42,123.7 acres*" within Brazoria, Fort Bend, Galveston, and Harris Counties. The CA further states, in Paragraph 5(A), that the right shall not divert in excess of a third of the permitted maximum rate for the right for more than seven consecutive days during the irrigation season, with three weeks to elapse between periods of full capacity, subject to additional conditions. This restriction is based on conditions which are no longer relevant to the CA or associated diversions. As part of the proposed amendment to CA 12-5168, GCWA seeks to remove these irrigation restrictions from the terms and conditions applicable to the water right.

## **Section 3 – Certificate of Adjudication 12-5171**

CA 12-5171 includes, in Paragraph 1(A), language that the authorization may be used to irrigate 25,000 acres of land within Brazoria, Fort Bend, and Galveston Counties. Additionally, Paragraph 3(B) states that "*The area authorized to be irrigated under this certificate of adjudication shall be coterminous with the Authority's service area within Brazoria, Fort Bend and Galveston Counties.*". As a wholesale provider to multiple water use categories, GCWA does not have a static service area and provides water to customers across a broad geographic area in Brazoria, Fort Bend, Galveston, and Harris Counties. It should also be noted that GCWA is seeking through the proposed amendment the ability to divert any portion of the water right for any use in Brazoria, Fort Bend, Galveston, or Harris Counties. As part of the proposed amendment to CA 12-5171, GCWA seeks to remove these irrigation restrictions from the terms and conditions applicable to the water right.

## **Section 4 – Certificate of Adjudication 12-5322**

CA 12-5322 includes, in Paragraph 2, language that the authorization may be used to irrigate "*a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.*". A modification to this language is applied in Paragraph 1 of CA 12-5322B, with the acreage limit retained. It should also be noted that GCWA is seeking through the proposed

amendment the ability to divert any portion of the water right for any use in Brazoria, Fort Bend, Galveston, or Harris Counties. As part of the proposed amendment to CA 12-5322, GCWA seeks to remove these irrigation restrictions from the terms and conditions applicable to the water right.



CERTIFICATE OF ADJUDICATION

CERTIFICATION OF ADJUDICATION: 12-5168      OWNERS: Brazos River Authority  
P. O. Box 7555  
Waco, Texas 76714-7555  
  
Galveston County Water  
Authority  
P. O. Box 1651  
Texas City, Texas 77590

COUNTIES: Brazoria, Fort Bend,  
Galveston and Harris      PRIORITY DATES: January 15, 1926  
and March 17,  
1947

WATERCOURSE: Brazos River      BASIN: Brazos River

WHEREAS, by final decree of the 26th Judicial District Court of Williamson County, Texas, in Cause No. 86-492-C, In Re: The Adjudication of Water Rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin maintained by the Brazos River Authority, Fort Bend County W.C.I.D. No. One and Galveston County Water Authority dated November 24, 1986 a right was recognized under Permit 1040I authorizing the Brazos River Authority and the Galveston County Water Authority to appropriate waters of the State of Texas as set forth below:

NOW, THEREFORE, this certificate of adjudication to appropriate waters of the State of Texas in the Brazos River Basin is issued to the Brazos River Authority, subject to the following terms and conditions:

1. IMPOUNDMENT

Owner, Galveston County Water Authority, is authorized to maintain an existing 7308 acre-foot capacity off-channel reservoir and to impound therein not to exceed 7308 acre-feet of water. The reservoir is located in the John W. Lyttle Grant, Abstract 17 and the John Sellers Survey, Abstract 180, Galveston County, Texas.

2. USE

- A. Owner, Brazos River Authority, is authorized to divert and use not to exceed 99,932 acre-feet of water per annum from the Brazos River for municipal and industrial purposes within the Authority's service area in Brazoria, Fort Bend and Galveston Counties, Texas.
- B. The Brazos River Authority is also authorized to divert and use any portion of the 99,932 acre-feet of water per annum that is not actually used for municipal and industrial purposes, pursuant to the authorization contained in the

Certificate of Adjudication 12-5168

preceding paragraph, to irrigate a maximum of 42,123.70 acres of land within the Authority's service area in Brazoria, Fort Bend, Galveston and Harris Counties, Texas.

3. DIVERSION

A. Location:

- (1) At a point on the east bank of the Brazos River in the Churchill Fulcher Grant, Abstract 29, Fort Bend County, Texas. This diversion point is also authorized under Certificates of Adjudication 12-5167 and 12-5171.
- (2) At a point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7, Fort Bend County, Texas. This diversion point is also authorized under Certificates of Adjudication 12-5166, 12-5167 and 12-5171.

B. Maximum combined rate: 685.00 cfs (308,250 gpm).

4. PRIORITY

- A. The time priority of the Brazos River Authority's right to divert and use water authorized herein is January 15, 1926.
- b. The time priority of the Galveston County Water Authority's right to maintain and impound water in the reservoir is March 17, 1947.

5. SPECIAL CONDITIONS

- A. The authorizations contained herein are subject to the terms of that agreement entered into on September 26, 1927 between the Brazos Valley Irrigation Company (now Brazos River Authority) and G. M. Jackson and W. S. Lehrer (now Richmond Irrigation Company and Houston Lighting and Power Company), which specified that the owner of this water right could not pump at a rate in excess of one-third the capacity set forth in this certificate (685 cfs) for more than seven days a month during the irrigation season, with three full weeks to elapse between each period of pumping at full capacity except when flows at the point of diversion exceeded the diversion authorized in the Jackson-Lehrer water right.
- B. The Galveston County Water Authority is authorized to store water purchased under Contractual Permit 137 in the aforesaid reservoir for subsequent diversion and use to the extent contained in said permit.

Certificate of Adjudication 12-5168

- C. The area authorized to be irrigated under this certificate of adjudication shall be conterminous with the Authority's service area within Brazoria, Fort Bend, Galveston and Harris Counties. The Authority will notify the Commission of any changes in the boundary of its service area.

The locations of pertinent features related to this certificate are shown on Pages 27, 31 and 37 of the Brazos IV River Segment Certificates of Adjudication Maps, copies of which are located in the office of the Texas Water Commission, Austin, Texas.

This certificate of adjudication is issued subject to all terms, conditions and provisions in the final decree of the 26th Judicial District Court of Williamson County, Texas, in Cause No. 86-492-C, In Re: The Adjudication of Water Rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin maintained by the Brazos River Authority, Fort Bend County W.D.I.D. No. One and Galveston County Water Authority dated November 24, 1986 and supersedes all rights of the owner asserted in that cause.

This certificate of adjudication is issued subject to senior and superior water rights in the Brazos River Basin.

This certificate of adjudication is issued subject to the rules of the Texas Water Commission and its continuing right of supervision of State Water Resources consistent with the public policy of the State as set forth in the Texas Water Code.

TEXAS WATER COMMISSION

*Paul Hopkins*

Paul Hopkins, Chairman

DATE ISSUED:

DEC 14 1987

ATTEST:

*Karen A. Phillips*  
Karen A. Phillips, Chief Clerk



CERTIFICATE OF ADJUDICATION

CERTIFICATION OF ADJUDICATION: 12-5171      OWNER: Brazos River Authority  
P. O. Box 7555  
Waco, Texas 76714-7555

COUNTIES: Brazoria, Fort Bend      PRIORITY DATES: February 1, 1939  
and Galveston      and  
December 12, 1950

WATERCOURSE: Brazos River      BASIN: Brazos River

WHEREAS, by final decree of the 26th Judicial District Court of Williamson County, Texas, in Cause No. 86-492-C, In Re: The Adjudication of Water Rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin maintained by the Brazos River Authority, Fort Bend County W.C.I.D. No. One and Galveston County Water Authority dated November 24, 1986 a right was recognized under Permit 1299D authorizing the Brazos River Authority to appropriate waters of the State of Texas as set forth below:

NOW, THEREFORE, this certificate of adjudication to appropriate waters of the State of Texas in the Brazos River Basin is issued to the Brazos River Authority, subject to the following terms and conditions:

1. USE

- A. Owner is authorized a priority right to divert and use not to exceed 50,000 acre-feet of water per annum from the Brazos River to irrigate 25,000 acres of land within the Authority's service area in Brazoria, Fort Bend and Galveston Counties, Texas. Owner may also use any portion of the 50,000 acre-feet of water for municipal, industrial and mining purposes that is not actually used for irrigation.
- B. Owner is also authorized to divert and use not to exceed an additional 75,000 acre-feet of water per annum from the Brazos River for municipal, industrial and mining purposes.

2. DIVERSION

- A. Location:
  - (1) At a point on the east bank of the Brazos River in the Churchill Fulcher Grant, Abstract 29, Fort Bend County, Texas. This diversion point is also authorized under Certificates of Adjudication 12-5167 and 12-5168.

Certificate of Adjudication 12-5171

- (2) At a point on the east bank of the Brazos River in the Thomas Barnett Grant, Abstract 7, Fort Bend County, Texas. This diversion point is also authorized under Certificates of Adjudication 12-5166 and 12-5167 and 12-5168.

B. Maximum combined rate: 600 cfs (270,000 gpm).

3. PRIORITY

- A. The time priority of owner's right is February 1, 1939 for the diversion and use of the first 75,000 acre-feet of water.
- B. The time priority of owner's right is December 12, 1950 for the diversion and use of the remaining 50,000 acre-feet of water.

3. SPECIAL CONDITIONS

- A. Owner's diversion of water at the diversion point located in the Churchill Fulcher Grant shall not diminish the flow of the Brazos River past that point of diversion to less than the amount of dedicated releases from conservation storage for downstream diversion plus the amount of flow necessary to honor rights senior to this certificate and located below said point of diversion, including the amount of flow necessary to allow diversion under Permit 1041 at the maximum diversion rate authorized. However, should the Authority determine from time to time that the owner or owners of said permit do not desire to divert the flow from the Brazos River or do not desire to divert said flow at the maximum diversion rate authorized, then from day to day owner may diminish the flow it is otherwise required to pass said diversion point under the terms of this condition by the difference in the maximum diversion rate authorized under Permit 1041 and that diversion rate the authority has determined that the owner or owners of said Permit 1041 desire to divert said flow.
- B. The area authorized to be irrigated under this certificate of adjudication shall be conterminous with the Authority's service area within Brazoria, Fort Bend and Galveston Counties. The Authority will notify the Commission of any changes in the boundary of its service area.

The locations of pertinent features related to this certificate are shown on Pages 27 and 29 of the Brazos IV river segment Certificates of Adjudication Maps, copies of which are located in the office of the Texas Water Commission, Austin, Texas.

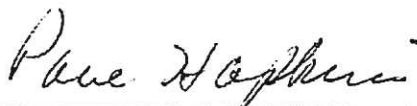
Certificate of Adjudication 12-5171

This certificate of adjudication is issued subject to all terms, conditions and provisions in the final decree of the 26th Judicial District Court of Williamson County, Texas, in Cause No. 86-492-C, In Re: The Adjudication of Water Rights in the Brazos River Basin and the San Jacinto-Brazos Coastal Basin maintained by the Brazos River Authority, Fort Bend County W.D.I.D. No. One and Galveston County Water Authority dated November 24, 1986 and supersedes all rights of the owner asserted in that cause.

This certificate of adjudication is issued subject to senior and superior water rights in the Brazos River Basin.

This certificate of adjudication is issued subject to the rules of the Texas Water Commission and its continuing right of supervision of State Water Resources consistent with the public policy of the State as set forth in the Texas Water Code.


TEXAS WATER COMMISSION

  
\_\_\_\_\_  
Paul Hopkins, Chairman

DATE ISSUED:

DEC 14 1987

ATTEST:

  
\_\_\_\_\_  
Karen A. Phillips, Chief Clerk



CERTIFICATE OF ADJUDICATION

CERTIFICATE OF ADJUDICATION: 12-5322      OWNER: Chocolate Bayou Water  
Company  
P. O. Box 1305  
Alvin, Texas 77511

COUNTIES: Fort Bend and Brazoria      PRIORITY DATES: February 8, 1929;  
March 14, 1955  
and July 25, 1983

WATERCOURSE: Brazos River      BASIN: Brazos River

WHEREAS, by final decree of the 21st Judicial District Court of Bastrop County, in Cause No. 18,762, In Re: The Adjudication of Water Rights in the Brazos IV Segment of the Brazos River Basin and the San Jacinto-Brazos Coastal Basin dated June 1, 1987 a right was recognized under Permit 1145E authorizing the Chocolate Bayou Water Company to appropriate waters of the State of Texas as set forth below:

NOW, THEREFORE, this certificate of adjudication to appropriate waters of the State of Texas in the Brazos River Basin is issued to the Chocolate Bayou Water Company, subject to the following terms and conditions:

1. IMPOUNDMENT

- A. Owner is authorized to maintain and impound water in an existing 200 acre-foot capacity off-channel reservoir (Juliff Reservoir). The reservoir is located in the William Pettus Grant, Abstract 68, Fort Bend County, Texas.
- B. Owner is authorized to maintain and impound water in an existing 144 acre-foot capacity off-channel reservoir (Bonney Reservoir). The reservoir is located in the Warren D. C. Hall Grant, Abstract 69, Brazoria County, Texas.
- C. Owner is authorized to maintain and impound water in an existing 520 acre-foot capacity off-channel reservoir (Liverpool Reservoir). The reservoir is located in the Day Land & Cattle Company Survey, Abstract 601, Brazoria County, Texas.

2. USE

Owner is authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas.

Certificate of Adjudication 12-5322

3. DIVERSION

- A. Location:  
At a point on the Brazos River in the William Pettus Grant,  
Abstract 68, Fort Bend County, Texas.
- B. Maximum rate: 900.00 cfs (405,000 gpm).

4. PRIORITY

- A. The time priority of owner's right is February 8, 1929 for the diversion and use of the first 40,000 acre-feet of water at a maximum diversion rate of 400 cfs (180,000 gpm).
- B. The time priority of owner's right is March 14, 1955 for the diversion and use of the next 40,000 acre-feet of water at a maximum diversion rate of 668 cfs (300,600 gpm).
- C. The time priority of owner's right is July 25, 1983 for the diversion and use of the remaining 75,000 acre-feet of water at the maximum authorized diversion rate of 900 cfs (405,000 gpm).

5. SPECIAL CONDITIONS

- A. The 115,000 acre-feet of water diverted under priority dates of March 14, 1955 and July 25, 1983, may be diverted only under certain flow restrictions measured at the USGS gaging station No. 08116650 on the Brazos River at Rosharon, Texas, which is to be reinstated by owner and provided with remote interrogation facilities prior to diversion.
  - (1) Owner is authorized to divert water only when the flow of the Brazos River at the USGS gaging station at Rosharon, Texas, equals or exceeds 700 cfs; or when the gaging station is below 700 cfs but is at least 15 cfs during April through August and 5 cfs during all other months of the year and the diversions of water hereunder are not injurious to senior downstream appropriators; or when the water being diverted are waters lawfully purchased by the owner from the Brazos River Authority under existing legal contract between the two parties, or other waters lawfully purchased under any other legal contract.
  - (2) The aforesaid streamflow restrictions are exclusive of any releases dedicated by the Brazos River Authority from its conservation storage for subsequent use downstream. The Executive Director has established a procedure for advising owner when water, exclusive of Brazos River Authority's dedicated releases, is available for

Certificate of Adjudication 12-5322

diversion hereunder. Owner shall contact the Commission prior to diversion of water hereunder each irrigation season to be advised of this procedure.

- (3) Owner shall establish and maintain sufficient daily diversion and streamflow records to document which authorizations and appropriate restrictions are being exercised.
  - (4) In order to prevent distortions in assessing any streamflow restriction requirements in analyses of future applications to appropriate water from the Brazos River, the Commission may for the purposes of these hydrology analyses consider that a 406 cfs streamflow restriction is sufficient to provide substantial protection to existing water rights. In making such analyses, the Commission should utilize the 406 cfs streamflow restriction, rather than the 700 cfs restriction.
- B. Owner is authorized to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation purposes in said coastal basin.
- C. Owner is authorized the use of the aforesaid reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season.

The location of pertinent features related to this certificate are shown on Pages 31 and 34 of the Brazos IV River Segment Certificates of Adjudication Maps, copies of which are located in the office of the Texas Water Commission, Austin, Texas.

This certificate of adjudication is issued subject to all terms, conditions and provisions in the final decree of the 21st Judicial District Court of Bastrop County, Texas, in Cause No. 18,762, In Re: The Adjudication of Water Rights in the Brazos IV Segment of the Brazos River Basin and the San Jacinto-Brazos Coastal Basin dated June 1, 1987 and supersedes all rights of the owner asserted in that cause.

This certificate of adjudication is issued subject to senior and superior water rights in the Brazos River Basin.



Certificate of Adjudication 12-5322

This certificate of adjudication is issued subject to the Rules of the Texas Water Commission and its continuing right of supervision of State water resources consistent with the public policy of the State as set forth in the Texas Water Code.

TEXAS WATER COMMISSION

*Paul Hopkins*  
Paul Hopkins, Chairman

DATE ISSUED:

JAN 14 1938

ATTEST:

*Karen A. Phillips*  
Karen A. Phillips, Chief Clerk

AMENDMENT TO  
CERTIFICATE OF ADJUDICATION

CERTIFICATE NO. 12-5322B

TYPE: AMENDMENT

Name: Chocolate Bayou  
Water Company

Address: P. O. Box 550  
Alvin, Texas 77512-0550

Filed: September 11, 1990 Granted: October 10, 1990

Purposes:	Industrial and Irrigation	Counties:	Fort Bend and Brazoria Counties
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Watercourse: Brazos River      Watershed: Brazos River Basin

WHEREAS, Certificate of Adjudication No. 12-5322 was issued to Chocolate Bayou Water Company on January 14, 1988 and authorizes owner to maintain and impound water in three off-channel reservoirs with impoundment capacities of 200, 144 and 520 acre-feet in Fort Bend and Brazoria Counties; and

WHEREAS, owner is also authorized to divert and use not to exceed 155,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the company's service area in Fort Bend and Brazoria Counties, Texas at a maximum diversion rate of 900 cfs (405,000 gpm); and

WHEREAS, Special Condition B. of Certificate No. 12-5322, authorizes the transfer of water from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation purposes; and

WHEREAS, Special Condition C. of Certificate No. 12-5322, authorized the use of the reservoirs solely as buffer reservoirs to facilitate pumping and efficiency, with no right to use the reservoirs for storage of State water other than during the irrigation season; and

WHEREAS, Certificate No. 12-5322A was issued on August 16, 1988 wherein Special Condition C., was changed and authorization was obtained to concurrently use the water stored in the aforesaid off-channel reservoirs for in-place industrial (fish farming) purposes; and

WHEREAS, Chocolate Bayou Water Company has requested an amendment to Certificate No. 12-5322, as amended, to convert water from irrigation purposes to industrial purposes; and to change Special Condition B. and C. for clarification purposes relating to the use change; and

WHEREAS, the Texas Water Commission finds that jurisdiction over the application is established; and

WHEREAS, no person protested the granting of this application; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Water Commission in issuing this amendment.

NOW, THEREFORE, this amendment to Certificate No. 12-5322, as amended, is issued to Chocolate Bayou Water Company, subject to the following provisions:

1. In lieu of uses previously authorized in Paragraph 2., USE, of Certificate No. 12-5322, as amended:

Owner is authorized to divert and use not to exceed 145,000 acre-feet of water per annum from the Brazos River to irrigate a maximum of 41,200 acres of land within the Company's Service Area in Fort Bend and Brazoria Counties, Texas and owner is authorized to divert and use not to exceed 10,000 acre-feet of water per annum for industrial purposes within the owner's service area.

2. In lieu of Special Condition C., contained in Certificate No. 12-5322A, owner is authorized the use of the aforesaid reservoirs to impound water for irrigation and industrial purposes.
3. In lieu of Special Condition B., contained in Certificate No. 12-5322, as amended, owner is authorized to transfer water diverted hereunder from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin for irrigation and industrial purposes in said coastal basin.

This amendment is issued subject to all terms, conditions and provisions contained in Certificate No. 12-5322, as amended, except as specifically amended herein.

This amendment is issued subject to all superior and senior water rights in the Brazos River Basin.



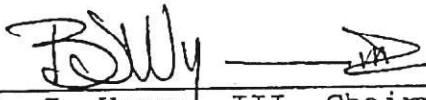
Certificate owner agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this amendment.

Certificate owner shall use those practices, techniques, and technologies that will reduce the loss or waste of water, improve the efficiency and use of water so that only so much water as can be beneficially used will be diverted. Furthermore, diversion and use will occur only when reasonably necessary because of prevailing climate conditions and subject to the terms and conditions of this certificate.

All other matters requested in the application which are not specifically granted by this amendment are denied.

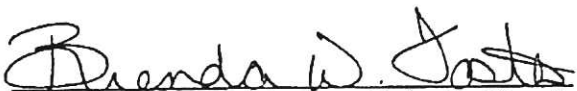
This amendment is issued subject to the Rules of the Texas Water Commission and to the right of continuing supervision of State water resources exercised by the Commission.

TEXAS WATER COMMISSION

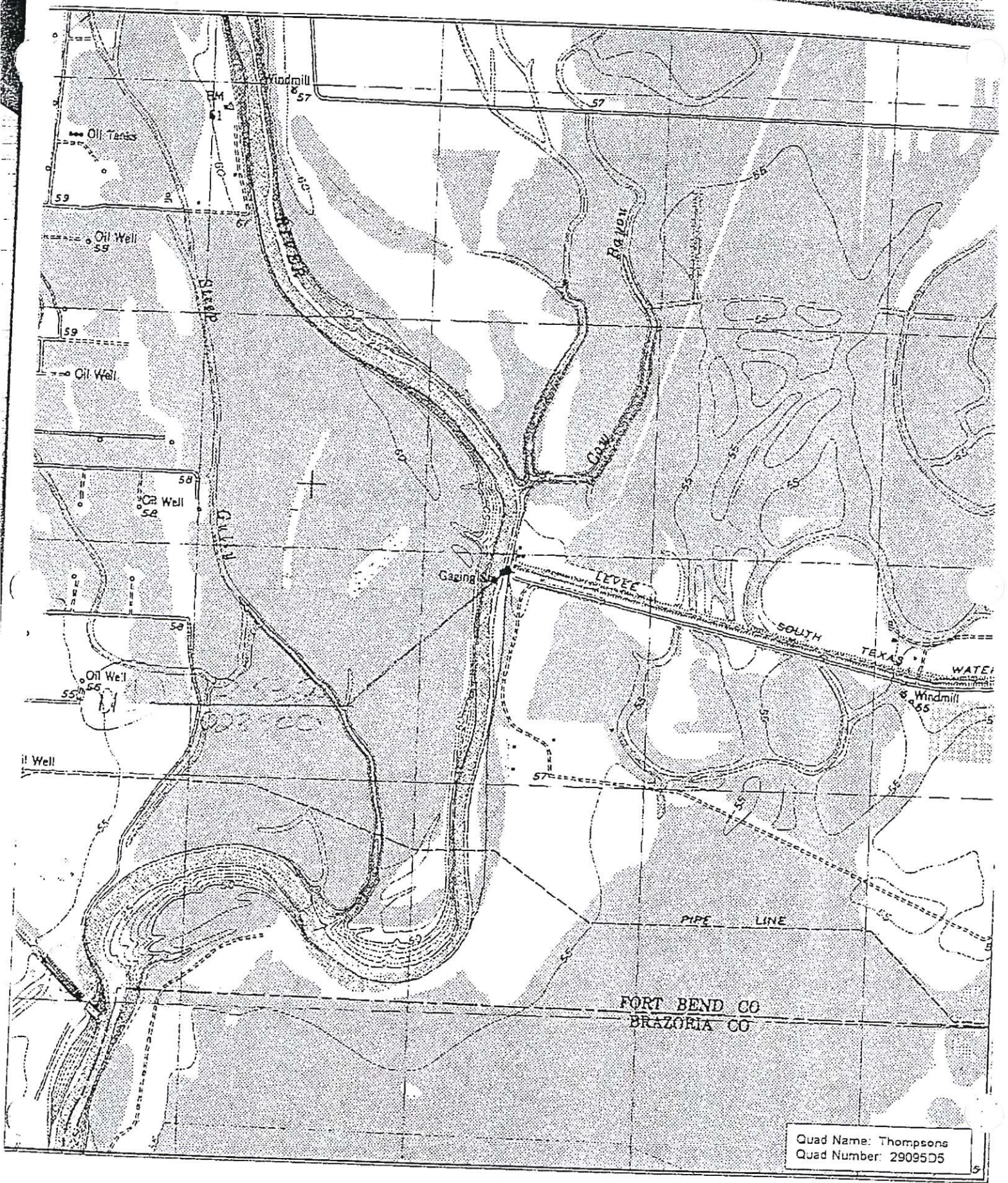
  
B. J. Wynne, III, Chairman

DATE ISSUED: OCT 29 1990

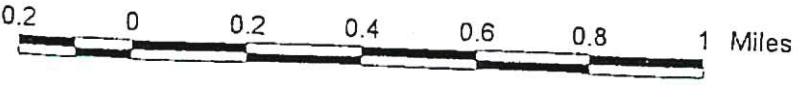
ATTEST:

  
Brenda W. Foster, Chief Clerk

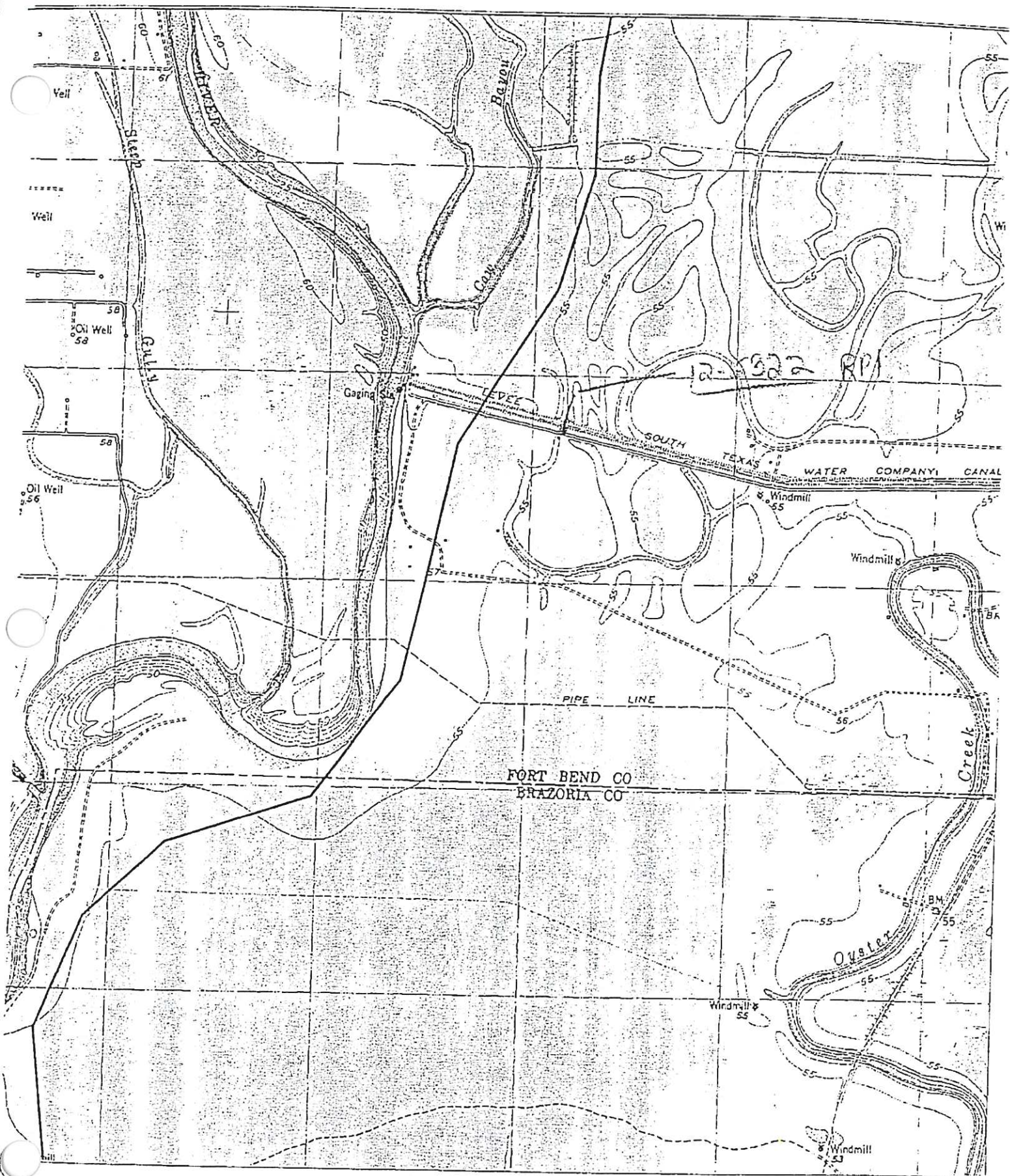




Quad Name: Thompsons  
Quad Number: 29095D5

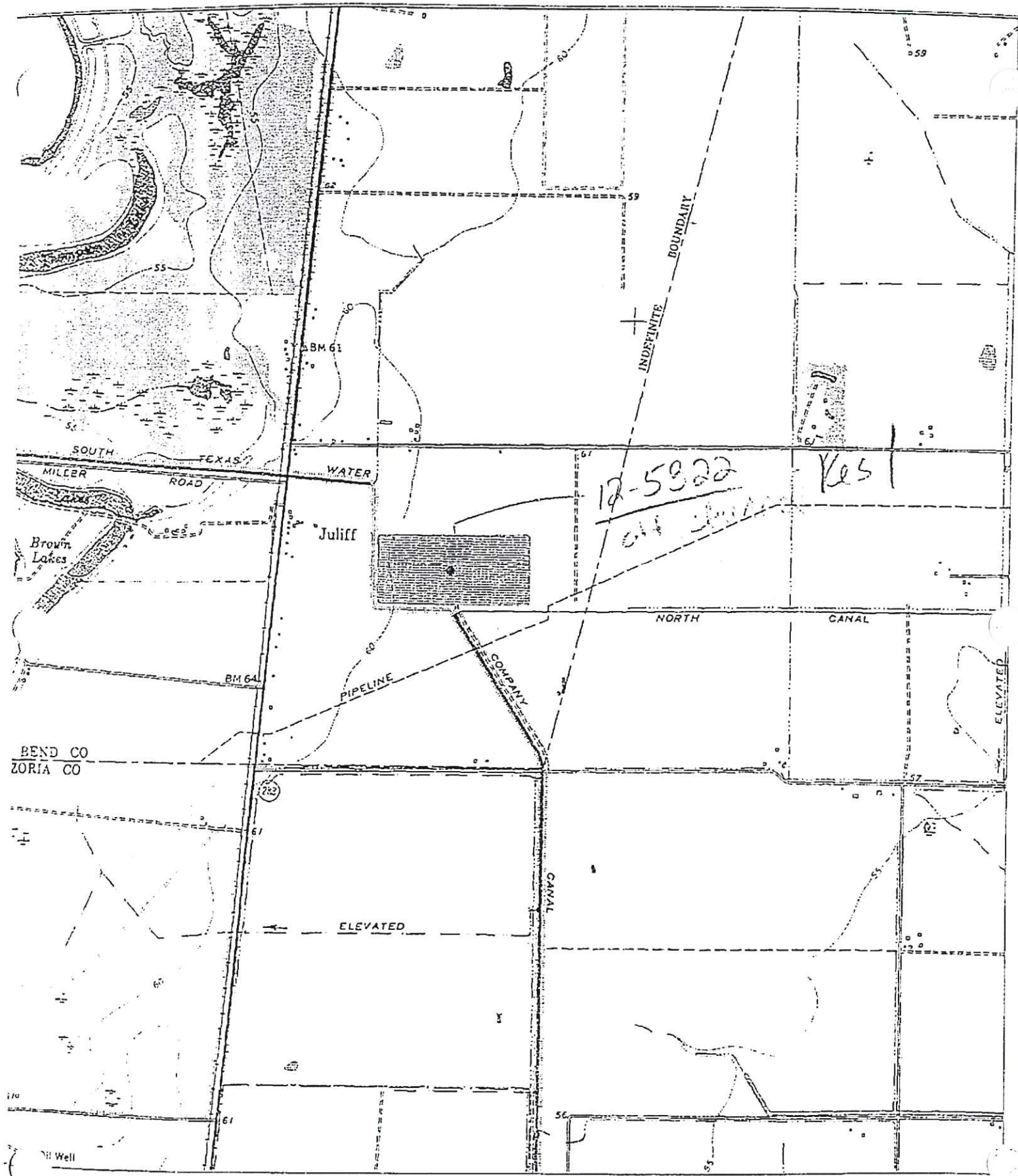






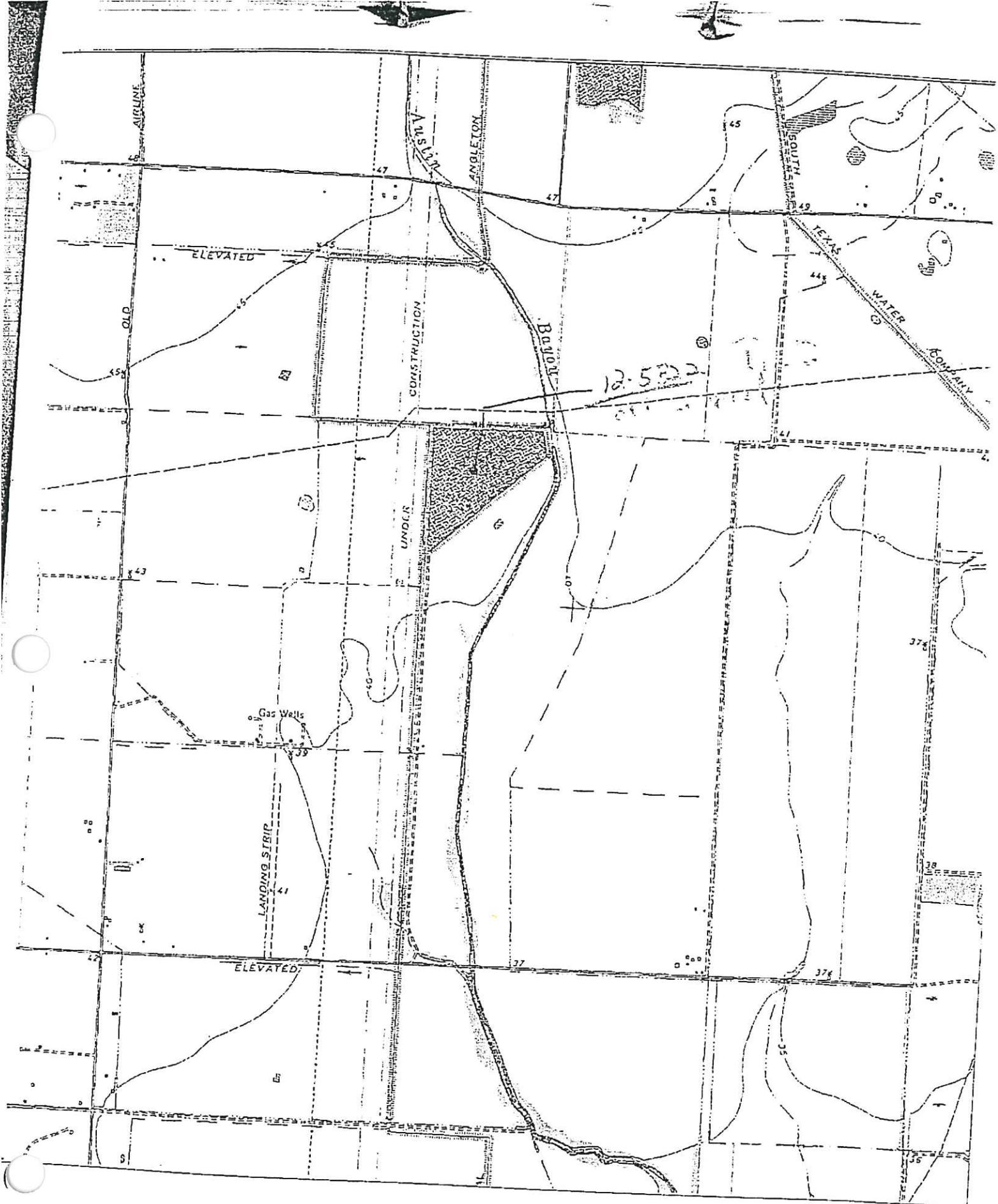
Quad Name: Thompsons  
Quad Number: 29095D5





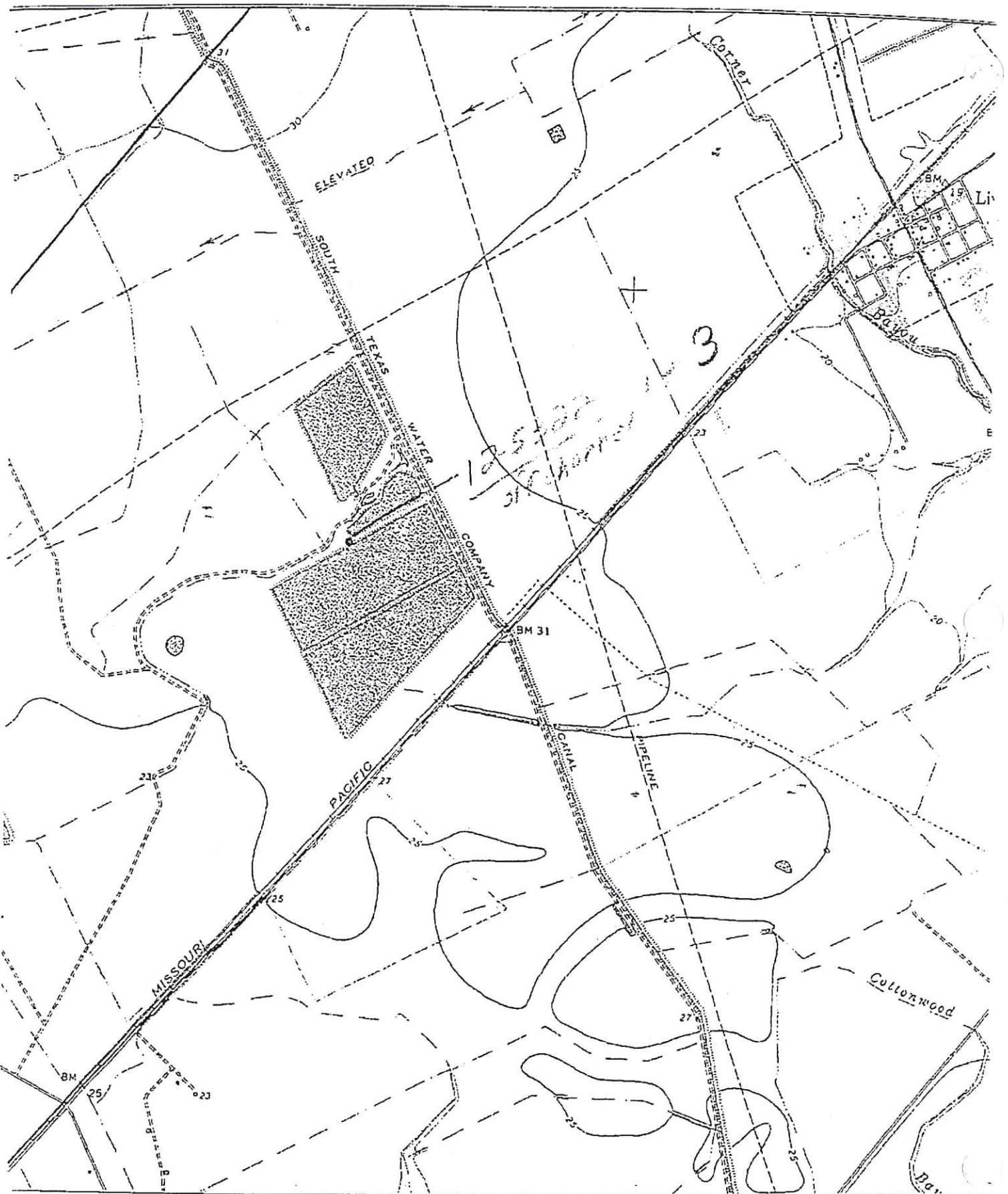
0.5 0 0.5 1 Miles

Quad Name: Juliff  
Quad Number: 29095D4



Quad Name: Otey  
Quad Number: 29095c4





Quad Name: Liverpool  
Quad Number: 29095C3



## **Attachment 12**

### **WAM Modeling and No Injury Analysis**

## Section 1 – Modifications to the Brazos River and San Jacinto Brazos Coastal Basin Water Availability Model (WAM)

This application seeks to amend three Certificates of Adjudication (CA): CA 12-5171, CA 12-5168, and CA 12-5322. The water availability analyses are based on the February 2018 version of the Brazos River and San Jacinto Brazos Coastal Basin Water Availability Model (WAM), full authorization scenario. In the full authorization scenario, there are no return flows and all water rights attempt to divert their full permitted amounts. The 2018 version of the Brazos WAM includes Senate Bill 3 instream flow requirements and the Brazos River Authority System Operations permit. WRAP-SIM is the computer program used to execute the WAMs. The analyses presented here use the May 2018 version of WRAP-SIM. Modeling procedures are discussed in greater detail in the following sections. Please note that the WAM code cited in the following sections consists primarily of excerpts of functional code specific to this analysis.

## Section 2 – MODELING OF CERTIFICATE OF ADJUDICATION 12-5171

### 2.1 ORIGINAL TCEQ WAM – MODELING OF CA 12-5171

The original TCEQ modeling of CA 12-5171 has diversions being taken at Control Point CON155, which is Diversion Point #2 in the terms used in this application.

WRCON155	3000.	MUN419390201	1	2	0.0000	C5171_1	C5171	gcwa
WRCON155	4500.	MUN419390201	1	2	0.0000	C5171_2	C5171	gcwa
WRCON155	19500.	MUN419390201	1	2	0.0000	C5171_3	C5171	gcwa
WRCON155	33750.	MUN419390201	1	2	0.0000	C5171_4	C5171	gcwa
WRCON155	14250.	MUN419390201	1	2	0.0000	C5171_5	C5171	gcwa
WRCON155	0.0	IND419390201	1	2	0.0000	C5171_6	C517165171002	
WRCON155	0.0	MIN419390201	1	2	0.0000	C5171_7	C517165171002	
WRCON155	50000.	IRR419501212	1	2	0.0000	C5171_8	C5171	gcwa

### 2.2 PRE-PROJECT MODEL – MODELING OF CA 12-5171

The TCEQ model above has diversions being taken at Point #2 only (i.e. CON155). However, CA 12-5171 is currently authorized to divert at Point #1 and Point #2. Within the Pre-Project Base Model used in the analyses presented in this application, diversions made under CA 12-5171 are diverted first from Point #1 and any remaining authorization is then diverted from Point #2, if available. This is implemented in the WRAP code below by diverting first at Control Point 516802 (i.e. Point #1) and then attempting to divert the full authorized amount at Control Point CON155 (i.e. Point #2) minus the diversions made at Point #1.

** Point #1								
WR516802	3000.	MUN419390201	1	2	0.0000	C5171A1	C5171	gcwa
WR516802	4500.	MUN419390201	1	2	0.0000	C5171A2	C5171	gcwa
WR516802	19500.	MUN419390201	1	2	0.0000	C5171A3	C5171	gcwa
WR516802	33750.	MUN419390201	1	2	0.0000	C5171A4	C5171	gcwa
WR516802	14250.	MUN419390201	1	2	0.0000	C5171A5	C5171	gcwa
WR516802	0.0	IND419390201	1	2	0.0000	C5171A6	C517165171002	
WR516802	0.0	MIN419390201	1	2	0.0000	C5171A7	C517165171002	
WR516802	50000.	IRR419501212	1	2	0.0000	C5171A8	C5171	gcwa
**								
** Point #2								
WRCON155	3000.	MUN419390201	1	2	0.0000	C5171B1	C5171	gcwa
TO	6	SUB				C5171A1		
WRCON155	4500.	MUN419390201	1	2	0.0000	C5171B2	C5171	gcwa
TO	6	SUB				C5171A2		

WRCON155	19500.	MUN419390201	1	2	0.0000		C5171B3	C5171	gcwa
TO	6	SUB				C5171A3			
WRCON155	33750.	MUN419390201	1	2	0.0000		C5171B4	C5171	gcwa
TO	6	SUB				C5171A4			
WRCON155	14250.	MUN419390201	1	2	0.0000		C5171B5	C5171	gcwa
TO	6	SUB				C5171A5			
WRCON155	0.0	IND419390201	1	2	0.0000		C5171B6	C517165171002	
TO	6	SUB				C5171A6			
WRCON155	0.0	MIN419390201	1	2	0.0000		C5171B7	C517165171002	
TO	6	SUB				C5171A7			
WRCON155	50000.	IRR419501212	1	2	0.0000		C5171B8	C5171	gcwa
TO	6	SUB				C5171A8			

\*\*

### 2.3 POST-PROJECT MODEL – MODELING OF CA 12-5171

The Pre-Project Model has diversions being taken preferentially at Point #1 (i.e. Control Point 516802), and then any remaining authorization at Point #2 (i.e. Control Point CON155), if available, which is consistent with existing authorizations in the Certificate of Adjudication as amended. The proposed amendments would also allow diversions to be made under CA 12-5171 at Point #3 (i.e. Control Point 532201). To model this in the Post-Project Model, diversions at Points #1 and #2 are modeled the same as the Pre-Project Model, but any remaining authorization not claimed at those two points is picked up at Point #3, if available.

\*\* Point #1

WR516802	3000.	MUN419390201	1	2	0.0000		C5171A1	C5171	gcwa
WR516802	4500.	MUN419390201	1	2	0.0000		C5171A2	C5171	gcwa
WR516802	19500.	MUN419390201	1	2	0.0000		C5171A3	C5171	gcwa
WR516802	33750.	MUN419390201	1	2	0.0000		C5171A4	C5171	gcwa
WR516802	14250.	MUN419390201	1	2	0.0000		C5171A5	C5171	gcwa
WR516802	0.0	IND419390201	1	2	0.0000		C5171A6	C517165171002	
WR516802	0.0	MIN419390201	1	2	0.0000		C5171A7	C517165171002	
WR516802	50000.	IRR419501212	1	2	0.0000		C5171A8	C5171	gcwa

\*\*

\*\* Point #2

WRCON155	3000.	MUN419390201	1	2	0.0000		C5171B1	C5171	gcwa
TO	6	SUB				C5171A1			
WRCON155	4500.	MUN419390201	1	2	0.0000		C5171B2	C5171	gcwa
TO	6	SUB				C5171A2			
WRCON155	19500.	MUN419390201	1	2	0.0000		C5171B3	C5171	gcwa
TO	6	SUB				C5171A3			
WRCON155	33750.	MUN419390201	1	2	0.0000		C5171B4	C5171	gcwa
TO	6	SUB				C5171A4			
WRCON155	14250.	MUN419390201	1	2	0.0000		C5171B5	C5171	gcwa
TO	6	SUB				C5171A5			
WRCON155	0.0	IND419390201	1	2	0.0000		C5171B6	C517165171002	
TO	6	SUB				C5171A6			
WRCON155	0.0	MIN419390201	1	2	0.0000		C5171B7	C517165171002	
TO	6	SUB				C5171A7			
WRCON155	50000.	IRR419501212	1	2	0.0000		C5171B8	C5171	gcwa
TO	6	SUB				C5171A8			

\*\*

\*\* Point #3

WR532201	3000.	MUN419390201	1	2	0.0000		C5171J1	C5171	gcwa
TO	6	SUB				C5171A1			
TO	6	SUB				C5171B1			
WR532201	4500.	MUN419390201	1	2	0.0000		C5171J2	C5171	gcwa
TO	6	SUB				C5171A2			
TO	6	SUB				C5171B2			
WR532201	19500.	MUN419390201	1	2	0.0000		C5171J3	C5171	gcwa
TO	6	SUB				C5171A3			
TO	6	SUB				C5171B3			
WR532201	33750.	MUN419390201	1	2	0.0000		C5171J4	C5171	gcwa
TO	6	SUB				C5171A4			
TO	6	SUB				C5171B4			
WR532201	14250.	MUN419390201	1	2	0.0000		C5171J5	C5171	gcwa
TO	6	SUB				C5171A5			



TO	6	1	SUB					C5171B5		
WR532201		0.0	IND419390201	1	2	0.0000		C5171J6	C517165171002	
TO	6	1	SUB					C5171A6		
TO	6	1	SUB					C5171B6		
WR532201		0.0	MIN419390201	1	2	0.0000		C5171J7	C517165171002	
TO	6	1	SUB					C5171A7		
TO	6	1	SUB					C5171B7		
WR532201	50000.		IRR419501212	1	2	0.0000		C5171J8	C5171	gcwa
TO	6	1	SUB					C5171A8		
TO	6	1	SUB					C5171B8		
**										

## Section 3 – MODELING OF CERTIFICATE OF ADJUDICATION 12-5168

### 3.1 ORIGINAL TCEQ WAM – MODELING OF CA 12-5168

The original TCEQ modeling of CA 12-5168 has diversions being taken at Control Point CON155 (Diversion Point #2 in the terms used in this application) using a SO record that specifies an alternative control point for streamflow depletions. The original TCEQ WAM includes the 7,373 ac-ft of storage authorized by CA 12-5168 but limits the annual depletion to the annual diversion amount. The modeling is further explained in the comment below from the original WAM.

\*\* This right authorizes two off-channel reservoirs (7308 acft from which diversions can be made for multi-uses; 65 acft for emergency fire fighting). The maximum that can be diverted from the Brazos River into these two reservoirs and subsequently used is 99932 acft/yr. Model both reservoirs together as a single combined reservoir because WRAP model does not have the capability to limit cumulative streamflow depletions made by more than one WR record. The reservoir storage has priority dates junior to the Brazos River diversion, but because the reservoirs are refilled by the Brazos River diversion, the priority of the storage is treated as identical to that of the diversion.

\*\* Changed diversion location to CON155

WR516841	1999.	MUN419260115	1	2	0.0000		C5168_1	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		1999. CON155							
WR516841	2998.	MUN419260115	1	2	0.0000		C5168_2	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		2998. CON155							
WR516841	12991.	MUN419260115	1	2	0.0000		C5168_3	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		12991. CON155							
WR516841	22485.	MUN419260115	1	2	0.0000		C5168_4	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		22485. CON155							
WR516841	9493.	MUN419260115	1	2	0.0000		C5168_5	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		9493. CON155							
WR516841	49966.	IND419260115	1	2	0.0000		C5168_6	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		49966. CON155							
WR516841	0.0	IRR419260115	1	2	0.0000		C5168_7	C5168	gcwa
WSRC5168	7373.	0.2710 0.8958		0	0				
SO		CON155							

### 3.2 PRE-PROJECT MODEL – MODELING OF CA 12-5168

The TCEQ model above has diversions being taken at Point #2 only (i.e. CON155). However, CA 12-5168 is currently authorized to divert at Point #1 and Point #2. Within the Pre-Project Base Model used in the analyses presented in this application, diversions made under CA 12-5168 are diverted first from Point #1 and any remaining authorization is then diverted from Point #2, if available. This is implemented in the WRAP code below by diverting first at Control Point 516802 (i.e. Point #1) and then attempting to divert the full authorized amount at Control Point CON155 (i.e. Point #2) minus

the diversions made at Point #1. In contrast to the TCEQ WAM, the authorized diversions are modeled as typical run-of-river rights without the storage associated with them. This simplifies the analysis and does not increase annual availability from the Brazos River, which is limited by the CA and modeled streamflow.

```

** Model as run-of-river diversions
** Point #1
WR516802 1999.    MUN419260115 1 2 0.0000    C5168A1  C5168  gcwa
WR516802 2998.    MUN419260115 1 2 0.0000    C5168A2  C5168  gcwa
WR516802 12991.   MUN419260115 1 2 0.0000    C5168A3  C5168  gcwa
WR516802 22485.   MUN419260115 1 2 0.0000    C5168A4  C5168  gcwa
WR516802 9493.    MUN419260115 1 2 0.0000    C5168A5  C5168  gcwa
WR516802 49966.   IND419260115 1 2 0.0000    C5168A6  C5168  gcwa
WR516802 0.0      IRR419260115 1 2 0.0000    C5168A7  C5168  gcwa
**
** Point #2
WRCON155 1999.    MUN419260115 1 2 0.0000    C5168B1  C5168  gcwa
TO 6 1 SUB C5168A1
WRCON155 2998.    MUN419260115 1 2 0.0000    C5168B2  C5168  gcwa
TO 6 1 SUB C5168A2
WRCON155 12991.   MUN419260115 1 2 0.0000    C5168B3  C5168  gcwa
TO 6 1 SUB C5168A3
WRCON155 22485.   MUN419260115 1 2 0.0000    C5168B4  C5168  gcwa
TO 6 1 SUB C5168A4
WRCON155 9493.    MUN419260115 1 2 0.0000    C5168B5  C5168  gcwa
TO 6 1 SUB C5168A5
WRCON155 49966.   IND419260115 1 2 0.0000    C5168B6  C5168  gcwa
TO 6 1 SUB C5168A6
WRCON155 0.0      IRR419260115 1 2 0.0000    C5168B7  C5168  gcwa
TO 6 1 SUB C5168A7
**

```

### 3.3 POST-PROJECT MODEL – MODELING OF CA 12-5168

The Pre-Project Model has diversions being taken preferentially at Point #1 (i.e. Control Point 516802), and then any remaining authorization at Point #2 (i.e. Control Point CON155), if available, which is consistent with existing authorizations in the Certificate of Adjudication as amended. The proposed amendments would also allow diversions to be made under CA 12-5168 at Point #3 (i.e. Control Point 532201). To model this in the Post-Project Model, diversions at Points #1 and #2 are modeled the same as the Pre-Project Model, but any remaining authorization not claimed at those two points is picked up at Point #3, if available.

```

** Point #1
WR516802 1999.    MUN419260115 1 2 0.0000    C5168A1  C5168  gcwa
WR516802 2998.    MUN419260115 1 2 0.0000    C5168A2  C5168  gcwa
WR516802 12991.   MUN419260115 1 2 0.0000    C5168A3  C5168  gcwa
WR516802 22485.   MUN419260115 1 2 0.0000    C5168A4  C5168  gcwa
WR516802 9493.    MUN419260115 1 2 0.0000    C5168A5  C5168  gcwa
WR516802 49966.   IND419260115 1 2 0.0000    C5168A6  C5168  gcwa
WR516802 0.0      IRR419260115 1 2 0.0000    C5168A7  C5168  gcwa
**
** Point #2
WRCON155 1999.    MUN419260115 1 2 0.0000    C5168B1  C5168  gcwa
TO 6 1 SUB C5168A1
WRCON155 2998.    MUN419260115 1 2 0.0000    C5168B2  C5168  gcwa
TO 6 1 SUB C5168A2
WRCON155 12991.   MUN419260115 1 2 0.0000    C5168B3  C5168  gcwa
TO 6 1 SUB C5168A3
WRCON155 22485.   MUN419260115 1 2 0.0000    C5168B4  C5168  gcwa
TO 6 1 SUB C5168A4
WRCON155 9493.    MUN419260115 1 2 0.0000    C5168B5  C5168  gcwa
TO 6 1 SUB C5168A5
WRCON155 49966.   IND419260115 1 2 0.0000    C5168B6  C5168  gcwa
TO 6 1 SUB C5168A6
WRCON155 0.0      IRR419260115 1 2 0.0000    C5168B7  C5168  gcwa

```



TO	6	1	SUB				C5168A7			
**										
** Point #3										
WR532201	1999.		MUN419260115	1	2	0.0000		C5168J1	C5168	gcwa
TO	6	1	SUB				C5168A1			
TO	6	1	SUB				C5168B1			
WR532201	2998.		MUN419260115	1	2	0.0000		C5168J2	C5168	gcwa
TO	6	1	SUB				C5168A2			
TO	6	1	SUB				C5168B2			
WR532201	12991.		MUN419260115	1	2	0.0000		C5168J3	C5168	gcwa
TO	6	1	SUB				C5168A3			
TO	6	1	SUB				C5168B3			
WR532201	22485.		MUN419260115	1	2	0.0000		C5168J4	C5168	gcwa
TO	6	1	SUB				C5168A4			
TO	6	1	SUB				C5168B4			
WR532201	9493.		MUN419260115	1	2	0.0000		C5168J5	C5168	gcwa
TO	6	1	SUB				C5168A5			
TO	6	1	SUB				C5168B5			
WR532201	49966.		IND419260115	1	2	0.0000		C5168J6	C5168	gcwa
TO	6	1	SUB				C5168A6			
TO	6	1	SUB				C5168B6			
WR532201	0.0		IRR419260115	1	2	0.0000		C5168J7	C5168	gcwa
TO	6	1	SUB				C5168A7			
TO	6	1	SUB				C5168B7			
**										

## Section 4 – MODELING OF CERTIFICATE OF ADJUDICATION 12-5322

### 4.1 ORIGINAL TCEQ WAM – MODELING OF CA 12-5322

The original TCEQ modeling of CA 12-5322 has diversions being taken at Control Point 532201, which is Diversion Point #3 in the terms used in this application. The TCEQ WAM does not model the storage authorized by CA 12-5322. This storage is relatively small. There is a 6,655 ac-ft/yr instream flow requirement associated with the existing authorization. A minimum flow of 15 cfs from April through August and 5 cfs for the rest of the year must be met. The modeling is further explained in the comment below from the original WAM.

\*\* Do not model three off-channel reservoirs. Reservoirs are only to be used for buffering  
 \*\* purposes to improve pumping efficiency of water diverted from the Brazos River -- there is no  
 \*\* right for perpetual impoundment of Brazos River water. Amendments A & B to C5322 state that  
 \*\* the reservoirs are authorized to impound water for industrial fish farming purposes; however,  
 \*\* the water available for perpetual impoundment is available from sources other than authorized  
 \*\* under the certificate. Based upon paragraph (4) of the SPECIAL CONDITIONS, a constant 406 cfs  
 \*\* instream flow restriction is to be used for hydrologic analyses in order to protect existing  
 \*\* rights. Special condition A.(1) states a 15 cfs or 5 cfs instream flow restriction when  
 \*\* diversions will not be injurious to senior downstream rights. The WRAP model protects senior  
 \*\* downstream rights, so use the lower instream flow requirement (5/15 cfs). Added municipal use  
 \*\* to reflect multiple uses authorized by amendment.

IFBRRO72	6655.	IFD11519290208	1			IFC5322_1				
** common GCWA group identifier										
WR532201	40000.	MUN419290208	1	2	0.0000		C5322_1	C5322	gcwa	
WR532201	40000.	MUN419550314	1	2	0.0000		C5322_4	C5322	gcwa	
WR532201	75000.	MUN419830725	1	2	0.0000		C5322_6	C5322	gcwa	
**										

### 4.2 PRE-PROJECT MODEL – MODELING OF CA 12-5322

The TCEQ model above has diversions being taken at Point #3 only (i.e. 532201). However, CA 12-5322 is currently authorized to divert at Point #2 and Point #3. Within the Pre-Project Base Model used in the analyses presented in this application, diversions made under CA 12-5322 are diverted



first from Point #2 and any remaining authorization is then diverted from Point #3, if available. This is implemented in the WRAP code below by diverting first at Control Point CON155 (i.e. Point #2) and then attempting to divert the full authorized amount at Control Point 532201 (i.e. Point #3) minus the diversions made at Point #2.

```

IFBR072 6655. IFD11519290208 1 IFC5322_1
** Point #2
WRCON155 40000. MUN419290208 1 2 0.0000 C5322B1 C5322 gcwa
WRCON155 40000. MUN419550314 1 2 0.0000 C5322B4 C5322 gcwa
WRCON155 75000. MUN419830725 1 2 0.0000 C5322B6 C5322 gcwa
** Point #3
WR532201 40000. MUN419290208 1 2 0.0000 C5322J1 C5322 gcwa
TO 6 1 SUB C5322B1
WR532201 40000. MUN419550314 1 2 0.0000 C5322J4 C5322 gcwa
TO 6 1 SUB C5322B4
WR532201 75000. MUN419830725 1 2 0.0000 C5322J6 C5322 gcwa
TO 6 1 SUB C5322B6
**

```

### 4.3 POST-PROJECT MODEL – MODELING OF CA 12-5322

The Pre-Project Model has diversions being taken preferentially at Point #2 (i.e. Control Point CON155), and then any remaining authorization at Point #3 (i.e. Control Point 532201), if available, which is consistent with existing authorizations in the Certificate of Adjudication as amended. The proposed amendments would also allow diversions to be made under CA 12-5322 at Point #1 (i.e. Control Point 516802). Within the Post-Project Model, diversions made under CA 12-5322 are taken preferentially at Point #1, then any remaining authorization is taken at Point #2, if available, and any remaining authorization at Point #3, if available. The WRAP code involving PX 1's and PX 4's limits the total diversion taken by CA 12-5322 at Points #1 and #2 in the Post-Project scenario to the amount taken at Point #2 in the Pre-Project scenario. In other words, the diversion made at Point #1 should not be greater than the diversion would have been if taken at Point #2. In this sense, the first simulation of WRAP's dual simulation option represents the pre-project modeling of CA 12-5322.

Diversions taken at Point #1 are modeled as being subject to the subsistence and base flow instream flow standards adopted for the Richmond Gage. The priority date of the instream flows in the Brazos WAM is 3/1/2012. The authorizations included in CA 12-5322 have three priority dates: 2/8/1929, 3/14/1955, and 7/25/1983. To maintain the same priority dates as the Certificate of Adjudication, the subsistence and base flow standards at the Richmond gage were assigned the same priority as the diversion such that they are turned on immediately prior to the diversion at Point #1 on a given priority date and turned off (by setting instream flow target to zero) immediately after the diversion at Point #1. This way, the diversion at Point #2 is not subject to those instream flow standards, which is consistent with the existing authorizations.

```

** Change for GCWA
CPSR5322 OUT 2 NONE NONE -3. 0.0000
CP5322DP OUT 2 NONE NONE -3. 0.0000
CP5322D2 OUT 2 NONE NONE -3. 0.0000

```

```

** GCWA Change:
CISR5322 9999999 9999999 9999999 9999999 9999999 9999999
CI 9999999 9999999 9999999 9999999 9999999 9999999

```

```

IFBR072 6655. IFD11519290208 1 IFC5322_1

```

```

** -----
** first simulation, no SB3
** -----
** 1929 priority
** try to take at point 2 during 1st simulation

```

```

WRCON155 40000.  MUN419290208  1  1  0.0000          C5322D1  C5322  gcwa
PX 1
** Calculate the total depletion for water right 5322, 1929 priority only
WRSR5322 19290208  1  1  0.0000          ComputeDep5322x  C5322  gcwa
TO 6 1.0 ADD C5322D1
PX 4
** This is the actual depletion obtained in the base run (1st simulation). It will try to obtain a
** large amount, but the actual depletion is limited to depletions in the first run.
WRSR5322 9999999  19290208          Depletion5322x  C5322  gcwa
PX 5
** 1955 priority
** try to take at point 2 during 1st simulation
WRCON155 40000.  MUN419550314  1  1  0.0000          C5322D4  C5322  gcwa
PX 1
** Calculate the total depletion for water right 5322, 1955 priority only
WRSR5322 19550314  1  1  0.0000          ComputeDep5322y  C5322  gcwa
TO 6 1.0 ADD C5322D4
PX 4
** This is the actual depletion obtained in the base run (1st simulation). It will try to obtain a
** large amount, but the actual depletion is limited to depletions in the first run.
WRSR5322 9999999  19550314          Depletion5322y  C5322  gcwa
PX 5
** 1983 priority
** try to take at point 2 during 1st simulation
WRCON155 75000.  MUN419830725  1  1  0.0000          C5322D6  C5322  gcwa
PX 1
** Calculate the total depletion for water right 5322, 1955 priority only
WRSR5322 19830725  1  1  0.0000          ComputeDep5322z  C5322  gcwa
TO 6 1.0 ADD C5322D6
PX 4
** This is the actual depletion obtained in the base run (1st simulation). It will try to obtain a
** large amount, but the actual depletion is limited to depletions in the first run.
WRSR5322 9999999  19830725          Depletion5322z  C5322  gcwa
PX 5
** -----
** Point 1, 1929 Priority
** -----
** SET SUBSISTENCE FLOW, 1929
IFRCSUBS 397757 RC-SUB19290208          ARC-SUB1
TO 16 MUL LOWDRY
PX 2
** SET DRY BASE FLOW, 1929
IFRC-DRY 749663 RC-DRY19290208          ARC-DRY1
TO 16 MUL LOWDRY
PX 2
WRRCNOSB 1 XMONTH19290208          ARCNOSUB2
FS 12 LOWDRY 0 1 1 9999999 1
PX 2
WRFKRC01 19290208          AHOLDRCBASE
TO 13 ADD ARC-DRY1
PX 2
WRFKRC02 19290208          ARCONOFF
TO 2 ADD BRR170 CONT
TO 6 DIV AHOLDRCBASE CONT
TO 6 ADD ARCNOSUB2
PX 2
IFRC-DRY 19290208          ARC-DRY2
TO 13 ADD ARC-DRY1
FS 5 FKRC02 1 0 1 9999999 1
PX 2
IFRCSUBS RC-SUB19290208 2          ARC-SUB2
TO 2 ADD BRR170 CONT
TO 13 SUB ARC-SUB1 CONT
TO 2 DIV HALF CONT
TO 13 ADD ARC-SUB1
FS 5 FKRC02 0 1 1 9999999 1
PX 2
IFRC-DRY 19290208          ARC-DRY3
TO 13 ADD ARC-SUB2 CONT
TO 13 MAX ARC-DRY2

```

```

PX      2
** SET AVG BASE FLOW, 1929
IFRC-AVG 1233703 RC-AVG19290208
TO      16      MUL      LOWAVG      ARC-AVG
PX      2
** SET WET BASE FLOW, 1929
IFRC-WET 2282856 RC-WET19290208
TO      16      MUL      LOWWET      ARC-WET
PX      2
**
** Now we have turned on the subsistence and base instream flow requirements at the 1929 priority
** and are making the diversion at Point 1 under CA 12-5322 at the 1929 priority
** This is the lumped depletion during the second simulation.
WR516802 0. 19290208 1 1 1.0000 5322DP LumpedDep5322x C5322 gcwa
TO      11      1.0      ADD      Depletion5322x
PX      2
** Point 1 - Begin Post-Project Operation
WR516802 40000. MUN419290208 1 1 0.0000 C5322A1 C5322 gcwa
SO      5322DP
PX      2
** Turn off SUBSISTENCE FLOW criteria, 1929
IFRCSUBS 0 RC-SUB19290208 BRC-SUB1
PX      2
**
** Turn off BASE FLOW criteria, 1929
IFRC-DRY 0 RC-DRY19290208 BRC-DRY1
PX      2
IFRCSUBS 0 RC-SUB19290208 BRC-SUB2
PX      2
IFRC-AVG 0 RC-AVG19290208 BRC-AVG
PX      2
IFRC-WET 0 RC-WET19290208 BRC-WET
PX      2
**
** -----
** Point 1, 1955 Priority
** -----
** SET SUBSISTENCE FLOW, 1955
IFRCSUBS 397757 RC-SUB19550314 CRC-SUB1
TO      16      MUL      LOWDRY
PX      2
**
** SET DRY BASE FLOW, 1955
IFRC-DRY 749663 RC-DRY19550314 CRC-DRY1
TO      16      MUL      LOWDRY
PX      2
WRRCNOSB 1 XMONTH19550314 CRCNOSUB2
FS      12 LOWDRY 0 1 1 9999999 1
PX      2
WRFKRC01 19550314 CHOLDRCBASE
TO      13      ADD      CRC-DRY1
PX      2
WRFKRC02 19550314 CRCONOFF
TO      2      ADD      BRRI70 CONT
TO      6      DIV      CHOLDRCBASE CONT
TO      6      ADD      CRCNOSUB2
PX      2
IFRC-DRY 19550314 CRC-DRY2
TO      13      ADD      CRC-DRY1
FS      5 FKRC02 1 0 1 9999999 1
PX      2
IFRCSUBS RC-SUB19550314 2 CRC-SUB2
TO      2      ADD      BRRI70 CONT
TO      13     SUB      CRC-SUB1 CONT
TO      2      DIV      HALF CONT
TO      13     ADD      CRC-SUB1
FS      5 FKRC02 0 1 1 9999999 1
PX      2
IFRC-DRY 19550314 CRC-DRY3
TO      13      ADD      CRC-SUB2 CONT
TO      13     MAX      CRC-DRY2

```



```

PX      2
** SET AVG BASE FLOW, 1955
IFRC-AVG 1233703 RC-AVG19550314          CRC-AVG
TO      16          MUL          LOWAVG
PX      2
** SET WET BASE FLOW, 1955
IFRC-WET 2282856 RC-WET19550314          CRC-WET
TO      16          MUL          LOWWET
PX      2
**
** Now we have turned on the subsistence and base instream flow requirements at the 1955 priority
** and are making the diversion at Point 1 under CA 12-5322 at the 1955 priority
** This is the lumped depletion during the second simulation.
WR516802 0.          19550314 1 1 1.0000 5322DP          LumpedDep5322y C5322 gcwa
TO      11          1.0 ADD          Depletion5322y
PX      2
** Point 1 - Begin Post-Project Operation
WR516802 40000. MUN419550314 1 1 0.0000          C5322A4 C5322 gcwa
SO      5322DP
PX      2
**
** Turn off SUBSISTENCE FLOW criteria, 1955
IFRCSUBS 0 RC-SUB19550314          DRC-SUB1
PX      2
**
** Turn off BASE FLOW criteria, 1955
IFRC-DRY 0 RC-DRY19550314          DRC-DRY1
PX      2
IFRCSUBS 0 RC-SUB19550314          DRC-SUB2
PX      2
IFRC-AVG 0 RC-AVG19550314          DRC-AVG
PX      2
IFRC-WET 0 RC-WET19550314          DRC-WET
PX      2
**
** -----
** Point 1, 1983 Priority
** -----
** SET SUBSISTENCE FLOW, 1983
IFRCSUBS 397757 RC-SUB19830725          ERC-SUB1
TO      16          MUL          LOWDRY
PX      2
**
** SET DRY BASE FLOW, 1983
IFRC-DRY 749663 RC-DRY19830725          ERC-DRY1
TO      16          MUL          LOWDRY
PX      2
WRRCNOSB 1 XMONTH19830725          ERCNOSUB2
FS      12 LOWDRY 0 1 1 9999999 1
PX      2
WRFKRC01 19830725          EHOLDRCBASE
TO      13          ADD          ERC-DRY1
PX      2
WRFKRC02 19830725          ERCONOFF
TO      2          ADD          BRRI70          CONT
TO      6          DIV          EHOLDRCBASE          CONT
TO      6          ADD          ERCNOSUB2
PX      2
IFRC-DRY 19830725          ERC-DRY2
TO      13          ADD          ERC-DRY1
FS      5 FKRC02 1 0 1 9999999 1
PX      2
IFRCSUBS RC-SUB19830725 2          ERC-SUB2
TO      2          ADD          BRRI70          CONT
TO      13          SUB          ERC-SUB1          CONT
TO      2          DIV          HALF          CONT
TO      13          ADD          ERC-SUB1
FS      5 FKRC02 0 1 1 9999999 1
PX      2
IFRC-DRY 19830725          ERC-DRY3
TO      13          ADD          ERC-SUB2          CONT

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TO      13          MAX                      ERC-DRY2
PX      2
** SET AVG BASE FLOW, 1983
IFRC-AVG 1233703 RC-AVG19830725          ERC-AVG
TO      16          MUL                      LOWAVG
PX      2
** SET WET BASE FLOW, 1983
IFRC-WET 2282856 RC-WET19830725          ERC-WET
TO      16          MUL                      LOWWET
PX      2
**
** Now we have turned on the subsistence and base instream flow requirements at the 1983 priority
** and are making the diversion at Point 1 under CA 12-5322 at the 1983 priority
** This is the lumped depletion during the second simulation.
WR516802 0.          19830725 1 1 1.0000 5322DP          LumpedDep5322z C5322 gcwa
TO      11          1.0      ADD          Depletion5322z
PX      2
** Point 1 - Begin Post-Project Operation
WR516802 75000.      MUN419830725 1 1 0.0000          C5322A6 C5322 gcwa
SO          5322DP
PX      2
**
** Turn off SUBSISTENCE FLOW criteria, 1983
IFRCSUBS 0 RC-SUB19830725          FRC-SUB1
PX      2
**
** Turn off BASE FLOW criteria, 1983
IFRC-DRY 0 RC-DRY19830725          FRC-DRY1
PX      2
IFRCSUBS 0 RC-SUB19830725          FRC-SUB2
PX      2
IFRC-AVG 0 RC-AVG19830725          FRC-AVG
PX      2
IFRC-WET 0 RC-WET19830725          FRC-WET
PX      2
**
** -----
** Points 2 & 3, All Priorities
** -----
** Point 2 - pick up any remaining water in 5322D2
WRCON155 0.          19290208 1 1 1.0000 5322D2          LumpedDep5322xb C5322 gcwa
TO      11          1.0      ADD          Depletion5322x
TO      6          1          SUB          C5322A1
PX      2
WRCON155 0.          19550314 1 1 1.0000 5322D2          LumpedDep5322yb C5322 gcwa
TO      11          1.0      ADD          Depletion5322y
TO      6          1          SUB          C5322A4
PX      2
WRCON155 0.          19830725 1 1 1.0000 5322D2          LumpedDep5322zb C5322 gcwa
TO      11          1.0      ADD          Depletion5322z
TO      6          1          SUB          C5322A6
PX      2
**
WRCON155 40000.      MUN419290208 1 2 0.0000          C5322B1 C5322 gcwa
SO          5322D2
PX      2
WRCON155 40000.      MUN419550314 1 2 0.0000          C5322B4 C5322 gcwa
SO          5322D2
PX      2
WRCON155 75000.      MUN419830725 1 2 0.0000          C5322B6 C5322 gcwa
SO          5322D2
PX      2
**
** Point 3
WR532201 40000.      MUN419290208 1 2 0.0000          C5322E1 C5322 gcwa
TO      6          1          SUB          C5322D1
PX      1
WR532201 40000.      MUN419550314 1 2 0.0000          C5322J4 C5322 gcwa
TO      6          1          SUB          C5322D4
PX      1
WR532201 75000.      MUN419830725 1 2 0.0000          C5322J6 C5322 gcwa

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TO      6      1      SUB
PX      1
**
WR532201  40000.    MUN419290208  1  2  0.0000
TO      6      1      SUB
TO      6      1      SUB
PX      2
WR532201  40000.    MUN419550314  1  2  0.0000
TO      6      1      SUB
TO      6      1      SUB
PX      2
WR532201  75000.    MUN419830725  1  2  0.0000
TO      6      1      SUB
TO      6      1      SUB
PX      2
**

```

C5322D6

C5322J1 C5322 gcwa

C5322A1  
C5322B1

C5322J4 C5322 gcwa

C5322A4  
C5322B4

C5322J6 C5322 gcwa

C5322A6  
C5322B6

## Section 5 – NO INJURY ANALYSIS

Table 11-1 shows the change in reliability and average annual shortage between the Pre-Project Model and the Post-Project Model for all water rights in the February 2018 version of the Brazos River WAM. The proposed amendments, modeled as described above, impact four existing junior water rights with an increase in mean shortage greater than 10 ac-ft and a decrease in volume reliability greater than one percentage point (Table 11-1). Those four model diversions are: P4016\_3, Lumped Dep 2925, C3775\_4, WTYT2\_DS\_IND. These diversions are associated with irrigation rights and diversions under the BRA System Operation permit. Impacts to other rights are de minimis.

**Table 11-1: Difference between Pre-Project WAM and Post-Project WAM**

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3014_1	0	0	0	0
C2867_1	0	0	0	0
C2306_1	0	0	0	0
C2293_1	0	0	0	0
C2868_1	0	0	0	0
C2974_1	0	0	0	0
C2903_1	0	0	0	0
C2923_1	0	0	0	0
C2923_2	0	0	0	0
C3761_1	0	0	0	0
C2977_1	0	0	0	0
C4152_1	0	0	0	0
C2975_1	0	0	0	0
C5352_1	0	0	0	0
C2971_1	0	0	0	0
C2988_1	0	0	0	0
C2987_1	0	0	0	0
C5347_1	0	0	0	0
C5348_1	0	0	0	0
C5346_1	0	0	0	0
C5346_2	0	0	0	0
C2976_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C5170_1	0	0	0	0
C4340_1	0	0	0	0
C5342_1	0	0	0	0
C5341_1	0	0	0	0
C4128_1	0	0	0	0
C4128_2	0	0	0	0
C4188_1	0	0	0	0
C2938_1	0	0	0	0
C4192_1	0	0	0	0
C2942_1	0	0	0	0
C2979_1	0	0	0	0
C4129_1	0	0	0	0
C5470_1	0	0	0	0
C4142_1	0	0	0	0
C4344_1	0	0	0	0
C2893_1	0	0	0	0
C2317_1	0	0	0	0
C4171_1	0	0	0	0
C2986_1	0	0	0	0
C3465_1	0	0	0	0
C3465_2	0	0	0	0
C3465_3	0	0	0	0
C3468_1	0	0	0	0
C4211_1	0	0	0	0
C4039_1	0	0	0	0
C4039_2	0	0	0	0
C5289_1	0	0	0	0
C4318_1	0	0	0	0
C4318_2	0	0	0	0
C4318_4	0	0	0	0
C3751_1	0	0	0	0
C2870_1	0	0	0	0
C4207_1	0	0	0	0
C5346_3	0	0	0	0
C5346_4	0	0	0	0
C2989_1	0	0	0	0
C2989_2	0	0	0	0
C4199_1	0	0	0	0
C4199_2	0	0	0	0
C4209_1	0	0	0	0
C2962_1	0	0	0	0
C3760_1	0	0	0	0
C3659_1	0	0	0	0
C2906_1	0	0	0	0
C4346_1	0	0	0	0
C4359_1	0	0	0	0
C2316_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2898_1	0	0	0	0
C2994_1	0	0	0	0
C2993_1	0	0	0	0
C2998_1	0	0	0	0
C2980_1	0	0	0	0
C4124_1	0	0	0	0
C4014_1	0	0	0	0
C4014_2	0	0	0	0
C4223_1	0	0	0	0
C4175_1	0	0	0	0
C4175_3	0	0	0	0
C4137_1	0	0	0	0
C4342_1	0	0	0	0
C5320_1	0	0	0	0
C5320_1bve	0	0	0	0
C5320_2	0	0	0	0
C4116_1	0	0	0	0
C5357_1	0	0	0	0
C4206_1	0	0	0	0
C4150_1	0	0	0	0
C4150_2	0	0	0	0
C4130_1	0	0	0	0
C4130_2	0	0	0	0
C4130_3	0	0	0	0
C3715_1	0	0	0	0
C3458_1	0	0	0	0
C3458_2	0	0	0	0
C4123_1	0	0	0	0
C3460_1	0	0	0	0
C4151_1	0	0	0	0
C2914_1	0	0	0	0
C3414_1	0	0	0	0
C2315_1	0	-0.06	0	0
C4344_2	0	0	0	0
C5328_1	0	-0.82	0	0.01
C2964_1	0	0	0	0
C3630_1	0	0	0	0
C2888_1	0	0	0	0
C3445_1	0	0	0	0
C4004_1	0	0	0	0
C4005_1	0	0	0	0
C4028_1	0	0	0	0
C4175_2	0	0	0	0
C4175_4	0	0	0	0
C2864_1	0	0	0	0
C2865_1	0	0	0	0
C4094_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C4121_1	0	0	0	0
C5345_1	0	0	0	0
C2860_1	0	0	0	0
C5344_1	0	0	0	0
C4161_1	0	0	0	0
C4161_2	0	0	0	0
C4161_3	0	0	0	0
C4019_1	0	0	0	0
C5357_2	0	0	0	0
C4120_1	0	0	0	0
Depletion 5155	0	0	0	0
Lumped Dep 5155	0	0	0	0
C2926_1	0	0	0	0
C4159_1	0	0	0	0
C5288_1	0	0	0	0
C4180_1	0	0	0	0
C2284_1	0	0	0	0
C2866_1	0	0	0	0
C2904_1	0	0	0	0
C5351_1	0	0	0	0
C5327_1	0	0.02	-0.14	-0.01
C5338_1	0	0	0	0
C2957_1	0	0	0	0
C5357_3	0	0	0	0
C3450_1	0	0	0	0
C4332_1	0	0	0	0
C4331_1	0	0	0	0
C4330_1	0	0	0	0
C4208_1	0	0	0	0
C5357_4	0	0	0	0
C3734_1	0	0	0	0
C5328_2	0	-0.15	0	0
C5328_4	0	0	0	0
C5328_5	0	0	0	0
C5328_6	0	0	0	0
C5357_5	0	0	0	0
C4039_3	0	0	0	0
C4039_4	0	0	0	0
C3750_1	0	0	0	0
C5364_1	0	0	0	0
C4158_1	0	0	0	0
C2871_1	0	0	0	0
C2872_1	0	0	0	0
C4219_1	0	0	0	0
C2851_1	0	0	0	0
C2880_1	0	0	0	0
C3748_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C5359_1	0	0	0	0
C4214_1	0	0	0	0
C2294_1	0	0	0	0
C4227_1	0	0	0	0
C4205_1	0	0	0	0
C2310_1	0	0	0	0
C3637_1	0	0	0	0
C2855_1	0	0	0	0
C2969_1	0	0	0	0
C2970_1	0	0	0	0
C2970_2	0	0	0	0
C2970_3	0	0	0	0
C5349_1	0	0	0	0
C2999_1	0	0	0	0
C4215_1	0	0	0	0
C4013_1	0	0	0	0
C4013_2	0	0	0	0
C4013_3	0	0	0	0
C4013_4	0	0	0	0
C3662_1	0	0	0	0
C2267_1	0	0	0	0
C2267_2	0	0	0	0
C3007_1	0	0	0	0
C5492_1	0	0	0	0
C5356_1	0	0	0	0
C4355_1	0	0	0	0
C5170_2	0	0	0	0
C5169_1	0	0	0	0
C4146_1	0	0	0	0
C4136_1	0	0	0	0
C4136_2	0	0	0	0
C3663_1	0	0	0	0
C2918_1	0	0	0	0
C4179_1	0	0	0	0
C4179_3	0	0	0	0
C4202_1	0	0	0	0
C4139_1	0	0	0	0
C4221_1	0	0	0	0
C4099_1	0	0	0	0
C4126_1	0	0	0	0
C4190_1	0	0	0	0
C4095_1	0	0	0	0
C2285_1	0	0	0	0
C2292_1	0	0	0	0
C4181_1	0	0	0	0
C3649_1	0	0	0	0
C2927_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3008_1	0	0	0	0
C4060_1	0	0	0	0
C4082_1	0	0	0	0
C2260_1	0	0	0	0
C2928_1	0	0	0	0
C2819_1	0	0	0	0
C2818_1	0	0	0	0
C2271_1	0	0	0	0
C2312_1	0	0	0	0
C2882_1	0	0	0	0
C2959_1	0	0	0	0
C4345_1	0	0	0	0
C4345_2	0	0	0	0
C5328_7	0	0	0	0
C3639_1	0	0	0	0
C3717_1	0	0	0	0
C3499_1	0	0	0	0
C5272_1	0	0	0	0
C2277_1	0	0	0	0
C4363_1	0	-0.52	0.15	0.14
C4363_3	0	-0.07	0.15	0.14
C3470_1	0	0	0	0
C3470_2	0	0	0	0
C3470_3	0	0	0	0
C3470_4	0	0	0	0
C3476_1	0	0	0	0
C3635_1	0	0	0	0
C3764_1	0	-0.07	0.15	0.14
C3636_1	0	0	0	0
C3660_1	0	0	0	0
C3763_1	0	-0.06	0.14	0.13
C5291_1	0	0	0	0
C3648_1	0	0	0	0
C3648_2	0	0	0	0
C2947_1	0	-0.02	0.15	0.21
C3744_1	0	-0.15	0.15	0.14
C4187_1	0	0	0	0
C3766_1	0	-0.12	0.29	0.13
C2210_1	0	0	0	0
C3643_1	0	0	0	0
C3692_1	0	0	0	0
C2229_1	0	0	0	0
C4336_1	0	-0.11	0.15	0.2
C4336_2	0	-0.11	0.15	0.2
C2295_1	0	0	0	0
C3756_1	0	-0.01	0.14	0.14
C4111_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2936_1	0	0	0	0
C3653_2	0	0	0	0
C2814_1	0	0	0	0
C2814_2	0	0	0	0
C4365_1	0	-1.33	0.15	0.14
C2992_1	0	-0.05	0	0.07
C3743_1	0	-0.04	0.14	0.14
C5271_1	0	0	0	0
C5271_2	0	0	0	0
C5329_1	0	0	0	0
C4052_1	0	0	0	0
C4098_1	0	0	0	0
C2936_2	0	0	0	0
C2830_1	0	0	0	0
C2830_2	0	0	0	0
C2933_1	0	0	0	0
C4165_1	0	0	0	0
C3647_1	0	0	0	0
C4212_1	0	0	0	0
C3458_3	0	0	0	0
C3458_4	0	0	0	0
C3458_5	0	0	0	0
C3458_6	0	0	0	0
C4225_1	0	0	0	0
C4051_1	0	0	0	0
C2276_8	0	0	0	0
C2856_1	0	0	0	0
C2874_1	0	0	0	0
C2877_1	0	0	0	0
C2884_1	0	0	0	0
C4370_1	0	-0.4	0.15	0.14
C4034_1	0	0	0	0
C3575_1	0	0	0	0
C4351_1	0	-0.06	0	0.03
C2239_1	0	0	0	0
C4218_1	0	0	0	0
C2303_1	0	0	0	0
C2304_1	0	0	0	0
C2304_2	0	0	0	0
C3010_1	0	-0.01	0.14	0.13
C4055_1	0	0	0	0
C4114_1	0	0	0	0
C2238_1	0	0	0	0
C2238_2	0	0	0	0
C2280_1	0	0	0	0
C3724_1	0	0	0	0
C2862_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C5325_1	0	0	0	0
C4117_1	0	0	0	0
C4177_1	0	0	0	0
C4178_1	0	0	0	0
C4197_1	0	0	0	0
C4062_1	0	0	0	0
C4103_1	0	0	0	0
C2254_1	0	0	0	0
C2264_1	0	0	0	0
C2265_1	0	0	0	0
C2857_1	0	0	0	0
C3595_1	0	0	0	0
C4168_1	0	0	0	0
C4061_1	0	0	0	0
C4323_1	0	-0.35	0.15	0.2
C4008_1	0	0	0	0
C3765_1	0	-0.21	0.15	0.13
C4371_1	0	-0.56	0.14	0.14
C3999_1	0	0	0	0
C4073_1	0	0	0	0
C4074_1	0	0	0	0
C4070_1	0	0	0	0
C4071_1	0	0	0	0
C3769_1	0	-0.2	0.14	0.14
C3773_1	0	-1.77	0.14	0.13
C3773_2	-1.8	-1.69	0.04	-0.01
C4368_1	0	-0.1	0.14	0.13
C5336_1	0	0	0	0
C5335_1	0	0	0	0
C4355_2	0	0	0	0
C4355_3	0	0.4	0	-0.02
C4355_4	0	0	0	0
C4067_1	0	0	0	0
C4072_1	0	0	0	0
C2290_1	0	0	0	0
C2290_2	0	0	0	0
C5286_1	0	0	0	0
C4004_2	0	0	0	0
C5287_1	0	0	0	0
C5287_2	0	0	0	0
C5287_3	0	0	0	0
C3000_1	0	-0.15	0.15	0.14
C4213_1	0	0	0	0
C4213_2	0	0	0	0
C4213_3	0	0	0	0
C4213_4	0	0	0	0
C4213_5	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C4213_7	0	0	0	0
C4213_8	0	0	0	0
C2961_1	0	-0.08	0.15	0.14
C2963_1	0	0	0	0.01
C2963_2	0	-0.01	0	0.16
C4366_1	0	-0.37	0.15	0.14
C4044_1	0	0	0	0
C2233_1	0	0	0	0
C3413_1	0	0	0	0
C4078_1	0	0	0	0
C2248_1	0	0	0	0
C4104_1	0	0	0	0
C2318_1	0	0	0	0
C3655_1	0	0	0	0
C2823_1	0	0	0	0
C2827_1	0	0	0	0
C2828_1	0	0	0	0
C2853_1	0	0	0	0
C2878_1	0	0	0	0
C2878_2	0	0	0	0
C2892_1	0	0	0	0
C2902_1	0	0	0	0
C3746_1	0	-0.02	0.14	0.13
C3718_1	0	0	0	0
C2315_2	0	0	0	0
C2919_1	0	0	0	0
C2301_1	0	0	0	0
C2837_1	0	0	0	0
C2837_2	0	0	0	0
C2835_1	0	0	0	0
C2237_1	0	0	0	0
C3440_1	0	0	0	0
C4189_1	0	0	0	0
C2243_1	0	0	0	0
C3693_1	0	0	0	0
C3693_2	0	0	0	0
C3444_1	0	0	0	0
C3444_2	0	0	0	0
C3444_3	0	0	0	0
C3716_1	0	0	0	0
C4115_1	0	0	0	0
C4006_1	0	0	0	0
C4045_1	0	0	0	0
C2282_1	0	0	0	0
C3638_1	0	0	0	0
C2875_1	0	0	0	0
C2907_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2907_2	0	0	0	0
C4364_1	0	-0.99	0.14	0.13
C4364_2	-1	-0.96	0.07	0
C4377_1	0	0	0	0
C2915_1	0	0	0	0
C3612_1	0	0	0	0
C2916_1	0	0	0	0
C3770_1	0	-0.2	0.14	0.13
C3774_1	0	-0.04	0.14	0.13
C4362_1	0	-0.5	0.14	0.13
C5277_1	0	0	0	0
C3446_1	0	0	0	0
C4155_1	0	0	0	0
C4163_1	0	0	0	0
C4162_1	0	0	0	0
C3456_1	0	0	0	0
C3584_1	0	0	0	0
C4100_1	0	0	0	0
C4326_1	0	-0.02	0.14	0.21
C4327_1	0	0	0.14	0.21
C2263_1	0	0	0	0
C2895_1	0	0	0	0
C2895_2	0	0	0	0
C4367_1	0	-0.2	0.15	0.13
C2829_1	0	0	0	0
C5354_1	0	0	0	0
C5366_1	0	0	0	0
C5366_2	0	0	0	0
C5366_3	0	0	0	0
C5366_4	0	0	0	0
C5328_9	0	-1.78	0	0
C5328_11	0	0	0	0
C3775_1	0	-0.79	0.14	0.13
C3775_2	0	-0.85	0.14	0.14
C3775_3	0	-0.09	0.14	0.14
C2281_1	0	0	0	0
C2226_1	0	0	0	0
C3642_1	0	0	0	0
C2948_1	0	-0.56	0.14	0.2
C2949_1	0	-0.08	0.14	0.2
C3726_1	0	0	0.14	0.01
C3453_1	0	0	0	0
C3690_1	0	0	0	0
C4046_1	0	-0.14	0.14	0.2
C4315_1	0	-0.06	0.14	0.2
C2299_1	0	0	0	0
C2831_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2879_1	0	0	0	0
C2879_2	0	0	0	0
C2883_1	0	0	0	0
C4222_1	0	0	0	0
C3754_1	0	0	0	0
C3675_1	0	0	0	0
C4226_1	0	0	0	0
C4108_1	0	0	0	0
C4108_2	0	0	0	0
C3736_1	0	0	0.15	0.14
C3558_1	0	0	0	0
C3651_1	0	0	0	0
C3651_2	0	0	0	0
C3660_2	0	0	0	0
C4360_1	0	0	0	0
C4360_2	0	0	0	0
C4767_1	0	0	0	0
C4316_1	0	-0.15	0.14	0.21
C2236_1	0	0	0	0
C2834_1	0	0	0	0
C2838_1	0	0	0	0
C2839_1	0	0	0	0
C2863_1	0	0	0	0
C2978_1	0	0	0	0
C3002_1	0	-0.2	0.15	0.14
C4361_1	0	-0.25	0.14	0.14
C4319_1	0	0	0	0
C5360_1	0	0	0	0
C4072_3	0	-0.23	0.14	0.2
C4001_1	0	-0.08	0.14	0.2
C2932_1	0	0	0	0
C3704_1	0	0	0	0
C4195_1	0	0	0	0
C4057_1	0	-0.22	0.14	0.2
C4031_1	0	0	0	0
C4031_2	0	0	0	0
C4031_3	0	0	0	0
C4031_4	0	0	0	0
C4031_5	0	0	0	0
C4170_1	0	0	0	0
C4054_1	0	-0.03	0.15	0.21
C4054_2	0	-0.05	0.15	0.21
C3771_1	0	-0.02	0.14	0.14
C4106_1	0	-0.32	0	0.01
C2950_1	0	-0.05	0.15	0.2
C2930_1	0	0	0	0
C2222_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C4122_1	0	0	0	0
C4176_1	0	0	0	0
C4009_1	0	-0.05	0.14	0.2
C4010_1	0	-0.07	0.14	0.2
C2221_1	0	0	0	0
C2255_1	0	0	0	0
C2255_2	0	0	0	0
C2255_3	0	0	0	0
C2869_1	0	0	0	0
C2952_1	0	0	0	0
C3009_1	0	-0.11	0.14	0.13
C3011_1	0	-0.03	0.14	0.13
C3011_2	0	-0.06	0.14	0.14
C3011_3	0	0	0.14	0.13
C3731_1	0	-0.04	0.14	0.13
C3688_1	0	0	0	0
C4020_1	0	0	0	0
C4194_1	0	0	0	0
C2291_2	0	0	0	0
C3461_1	0	0	0	0
C3506_1	0	0	0	0
C4089_1	0	-0.07	0.14	0.2
C3658_1	0	0	0	0
C2917_1	0	0	0	0
C4149_1	0	0	0	0
C4000_1	0	-0.07	0.14	0.2
C4022_1	0	0	0	0
C2235_1	0	0	0	0
C2911_1	0	0	0	0
C2935_1	0	0	0	0
C2935_2	0	0	0	0
C3755_1	0	0	0	0
C3755_2	0	0	0	0
C3740_1	0	-0.02	0.14	0.13
C4338_1	0	-0.27	0.15	0.2
C4339_1	0	-0.14	0.15	0.14
C4147_1	0	0	0	0
C2220_1	0	0	0	0
C2981_1	0	-0.01	0.15	0.13
C2981_2	0	-0.06	0.15	0.13
C2981_3	0	-0.01	0.15	0.14
C2982_1	0	-0.01	0.15	0.13
C2983_1	0	-0.01	0.15	0.14
C2984_1	0	-0.02	0.14	0.13
C2985_1	0	-0.02	0	0.12
C5319_1	0	0	0	0
C2965_1	0	-0.05	0.14	0.13

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2965_2	0	-0.03	0.14	0.13
C2966_1	0	-0.01	0	0.05
C3735_1	0	-0.04	0.14	0.13
C3753_1	0	0	0	0
C3626_1	0	0	0	0
C2251_1	0	0	0	0
C4172_1	0	0	0	0
C4203_1	0	0	0	0
C4204_1	0	0	0	0
C4063_1	0	-0.7	0.15	0.21
C3606_1	0	0	0	0
C2305_1	0	0	0	0
C3654_1	0	0	0	0
C3654_2	0	0	0	0
C2937_1	0	0	0	0
C2951_1	0	-0.07	0.15	0.2
C4065_1	0	-0.17	0.15	0.2
C4321_1	0	-0.68	0.14	0.2
C3653_1	0	0	0	0
C4376_1	0	-0.1	0.14	0.14
C4083_1	0	-0.09	0.15	0.2
C2997_1	0	-0.09	0.15	0.14
C3720_1	0	0	0	0
C3691_1	0	0	0	0
Depletion 5159	0	0	0	0
Lumped Dep 5159	0	0	0	0
Depletion 5160	0	0	0	0
Lumped Dep 5160	0	0	0	0
Depletion 5161	0	0	0	0
Lumped Dep 5161	0	-18.56	0.17	0.03
Depletion 5164	0	0	0	0
Lumped Dep 5164	0	0.01	-0.16	0
C3443_1	0	0	0	0
C4119_1	0	0	0	0
C4118_1	0	0	0	0
C3463_1	0	0	0	0
C4015_1	0	0	0	0
C4035_1	0	-0.01	0.15	0.2
C4059_1	0	-0.07	0.14	0.2
C4064_1	0	-0.05	0.14	0.2
C4072_2	0	-0.35	0.14	0.2
C3512_1	0	0	0	0
C4093_1	0	-0.19	0.15	0.2
C4102_1	0	-0.15	0.15	0.21
C4317_1	0	-0.49	0.14	0.2
C2234_1	0	0	0	0
C2252_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2268_1	0	0	0	0
C2291_1	0	0	0	0
C2307_1	0	0	0	0
C3640_1	0	0	0	0
C2824_1	0	0	0	0
C2854_1	0	0	0	0
C2876_1	0	0	0	0
C2881_1	0	0	0	0
C2890_1	0	0	0	0
C2910_1	0	0	0	0
C2967_1	0	0	0	0
C2972_2	0	0	0	0
C3015_1	0	-0.05	0.14	0.14
C3745_1	0	-0.04	0.15	0.14
C4375_1	0	0	0	0.01
Depletion 5156	0	0	0	0
Lumped Dep 5156	0	-49.12	0.17	0.06
C3739_1	0	-0.34	0.14	0.14
C4138_1	0	0	0	0
C4112_1	0	0	0	0
C2973_1	0	0	0	0
C4220_1	0	0	0	0
C4023_1	0	0	0	0
C4050_1	0	0	0	0
C4049_1	0	0	0	0
C3742_1	0	-0.03	0.15	0.14
C3742_2	0	-0.01	0.14	0.13
C3741_1	0	-0.02	0.15	0.14
C3741_2	0	-0.02	0.15	0.14
C3447_1	0	0	0	0
C4156_1	0	0	0	0
C4191_1	0	0	0	0
C4191_2	0	0	0	0
C4038_1	0	0	0	0
C4113_1	0	0	0	0
C4322_1	0	-0.35	0.14	0.2
C3661_1	0	0	0	0
C4328_1	0	-0.08	0.14	0.2
C3482_1	0	0	0	0
C4092_1	0	-0.01	0.14	0.2
C4335_1	0	-0.08	0.15	0.2
C3634_1	0	0	0	0
C3650_1	0	0	0	0
C3652_1	0	0	0	0
C2887_1	0	0	0	0
C4334_1	0	0	0	0
C4148_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3459_1	0	0	0	0
C4077_1	0	-0.06	0.14	0.2
C4079_1	0	-0.01	0	0.01
C2891_1	0	0	0	0
C4012_8	0	0	0	0
C4047_1	0	0	0	0
C4133_1	0	0	0	0
C4144_1	0	0	0	0
C4145_1	0	0	0	0
C3544_1	0	0	0	0
C4107_1	0	-0.46	0.14	0.21
C4329_1	0	-0.12	0.14	0.17
C4329_2	0	-1.72	0.14	0.2
C2219_1	0	0	0	0
C2283_1	0	0	0	0
C2852_1	0	0	0	0
C2873_1	0	0	0	0
C2900_1	0	0	0	0
C4348_1	0	0	0	0
C4027_1	0	0	0	0
C4091_1	0	-0.06	0	0.01
C3653_3	0	0	0	0
C2244_1	0	0	0	0
C2245_1	0	0	0	0
C3721_1	0	0	0	0
C5323_1	0	0	0	0
C2298_1	0	0	0	0
C3013_1	0	-0.18	0.14	0.1
C4037_1	0	0	0	0
C3440_2	0	0	0	0
C3548_1	0	0	0	0
C4210_1	0	0	0	0
C2920_1	0	0	0	0
C3768_1	0	-0.01	0.14	0.14
C4353_1	0	0	0	0
C4354_1	0	0	0	0
C3593_1	0	0	0	0
C4324_1	0	-0.61	0.15	0.2
C2940_1	0	-0.13	0.14	0.2
C3005_1	0	-0.01	0.14	0.14
C2909_1	0	0	0	0
C2813_1	0	0	0	0
C4173_1	0	0	0	0
C4032_1	0	0	0	0
C3522_1	0	0	0	0
C3546_1	0	0	0	0
C2313_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3657_1	0	0	0	0
C3454_1	0	0	0	0
C4041_1	0	0	0	0
C4042_1	0	0	0	0
C2841_1	0	0	0	0
C2842_1	0	0	0	0
C3696_1	0	0	0	0
C4087_1	0	0	0	0
C3614_1	0	0	0	0
C2227_1	0	0	0	0
C2934_1	0	0	0	0
C4132_1	0	0	0	0
C4166_1	0	0	0	0
C4002_1	0	0	0	0
C3467_1	0	0	0	0
C2259_1	0	0	0	0
C2287_1	0	0	0	0
C2288_1	0	0	0	0
C2821_1	0	0	0	0
C2822_1	0	0	0	0
C2859_1	0	0	0	0
C2894_1	0	0	0	0
C2896_1	0	0	0	0
C2901_1	0	0	0	0
C2931_1	0	0	0	0
C2991_1	0	0	0	0
C4369_1	0	0	0	0
C3448_1	0	0	0	0
C2995_1	0	0	0	0
C5357_6	0	0	0	0
C2246_1	0	0	0	0
C3721_2	0	0	0	0
C2996_1	0	0	0	0
C2996_2	0	0	0	0
C3479_1	0	0	0	0
C3623_1	0	0	0	0
C3623_2	0	0	0	0
C3624_1	0	0	0	0
C3624_2	0	0	0	0
C4216_1	0	0	0	0
C3500_1	0	0	0	0
C2990_1	0	0	0	0
C4135_1	0	0	0	0
C4350_1	0	0	0	0
C3666_1	0	0	0	0
C2924_1	0	0	0	0
C3553_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C4088_1	0	-0.11	0.14	0.21
C4337_1	0	-0.12	0.14	0.2
C2225_1	0	0	0	0
C2922_1	0	0	0	0
C2945_1	0	-0.07	0.15	0.21
C4080_1	0	-0.22	0.15	0.2
C4081_1	0	-0.33	0.15	0.2
C4076_1	0	-0.03	0.15	0.2
C4076_2	0	-0.05	0.15	0.21
C4011_1	0	0	0	0
C4110_1	0	0	0	0
C2308_1	0	0	0	0
C3631_1	0	0	0	0
C3656_1	0	0	0	0
C2826_1	0	0	0	0
C2833_1	0	0	0	0
C3747_1	0	-0.39	0.15	0.14
C3772_1	0	-0.01	0.14	0.13
C3708_1	0	0	0	0
C3698_1	0	0	0	0
C3514_1	0	0	0	0
C2851_2	0	0	0	0
C3451_1	0	0	0	0
C3451_2	0	0	0	0
C3511_1	0	0	0	0
C3757_1	0	-0.01	0	0.01
C4186_1	0	0	0	0
C4186_2	0	0	0	0
C4342_2	0	-1.82	0	0.01
C2230_1	0	0	0	0
C2231_1	0	0	0	0
C4040_1	0	0	0	0
C3452_1	0	0	0	0
C3694_1	0	0	0	0
C4140_1	0	0	0	0
C4164_1	0	0	0	0
C2258_1	0	0	0	0
C2266_1	0	0	0	0
C2269_1	0	0	0	0
C2272_1	0	0	0	0
C2278_1	0	0	0	0
C2302_1	0	0	0	0
C2820_1	0	0	0	0
C2832_1	0	0	0	0
C2847_1	0	0	0	0
C2850_1	0	0	0	0
C2850_2	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2885_1	0	0	0	0
C2886_1	0	0	0	0
C2941_1	0	-0.07	0.15	0.2
C5284_1	0	0	0	0
C3627_1	0	0	0	0
C2843_1	0	0	0	0
C2844_1	0	0	0	0
C4356_1	0	0	0	0
C3730_1	0	-0.03	0.28	0.13
C2825_1	0	0	0	0
C2921_1	0	0	0	0
C3592_1	0	0	0	0
C3540_1	0	0	0	0
C3540_2	0	0	0	0
C4127_1	0	0	0	0
C3006_1	0	-0.01	0	0.01
C3749_1	0	-0.15	0.14	0.14
C4196_1	0	0	0	0
C3495_1	0	0	0	0
C4141_1	0	0	0	0
C3620_1	0	0	0	0
C2270_1	0	0	0	0
C3633_1	0	0	0	0
C3490_1	0	0	0	0
C3632_1	0	0	0	0
C3713_1	0	0	0	0
C3455_1	0	0	0	0
C3530_1	0	0	0	0
C3530_2	0	0	0	0
C3530_4	0	0	0	0
C4325_1	0	-0.09	0.15	0.2
C3646_1	0	0	0	0
C3003_1	0	0	0	0
C4068_1	0	0	0	0
C3534_1	0	0	0	0
C3540_3	0	0	0	0
C3618_1	0	0	0	0
C3618_2	0	0	0	0
C3618_4	0	0	0	0
C4320_1	0	-0.17	0.15	0.2
C2250_1	0	0	0	0
C3004_1	0	0	0	0
C3518_1	0	0	0	0
C4090_1	0	-0.02	0	0.01
C3469_1	0	0	0	0
C3492_1	0	0	0	0
C4167_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C4056_1	0	0	0	0
C3520_1	0	0	0	0
C3550_1	0	0	0	0
C3620_2	0	0	0	0
C3709_1	0	0	0	0
C4157_1	0	0	0	0
C2261_1	0	0	0	0
C2262_1	0	0	0	0
C2279_1	0	0	0	0
C2300_1	0	0	0	0
C2309_1	0	0	0	0
C2836_1	0	0	0	0
C2858_1	0	0	0	0
C2861_1	0	0	0	0
C2897_1	0	0	0	0
C2905_1	0	0	0	0
C2908_1	0	0	0	0
C2960_1	0	0	0	0
C3001_1	0	0	0	0
C3668_1	0	0	0	0
Depletion 5162	0	0	0	0
Lumped Dep 5162	0	-6.7	0	0.04
Depletion 5163	0	0	0	0
Lumped Dep 5163	0	-14.25	0.37	0.05
C3487_1	0	0	0	0
C2216_1	0	0	0	0
C2215_1	0	0	0	0
C2228_1	0	0	0	0
C3572_1	0	0	0	0
C2201_1	0	0	0	0
C2232_1	0	0	0	0
C3547_1	0	0	0	0
C3504_1	0	0	0	0
C2247_1	0	0	0	0
C2249_1	0	0	0	0
C3556_1	0	0	0	0
C3557_1	0	0	0	0
C3709_2	0	0	0	0
C3710_1	0	0	0	0
C3667_1	0	0	0	0
C3617_1	0	0	0	0
C3541_1	0	0	0	0
C3618_3	0	0	0	0
C3549_1	0	0	0	0
C2845_1	0	0	0	0
C2846_1	0	0	0	0
C3719_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C2955_1	0	0	0	0
C3505_1	0	0	0	0
C3481_1	0	0	0	0
C3517_1	0	0	0	0
C3678_1	0	0	0	0
C3496_1	0	0	0	0
C5355_1	0	0	0	0
C3703_1	0	0	0	0
C2816_1	0	0	0	0
C2815_1	0	0	0	0
C3689_1	0	0	0	0
C3539_1	0	0	0	0
C3533_1	0	0	0	0
C5351_2	0	0	0	0
C3474_1	0	0	0	0
C3521_1	0	0	0	0
C4109_1	0	0	0	0
C3475_1	0	0	0	0
C3699_1	0	0	0	0
C3523_1	0	0	0	0
C3615_1	0	0	0	0
C3616_1	0	0	0	0
C3554_1	0	0	0	0
C3593_2	0	0	0	0
C3483_1	0	0	0	0
C3718_2	0	0	0	0
C5275_1	0	0	0	0
C5275_2	0	0	0	0
C3579_1	0	0	0	0
C3596_1	0	0	0	0
C3530_3	0	0	0	0
C3528_1	0	0	0	0
C3528_2	0	0	0	0
C3488_1	0	0	0	0
C3695_1	0	0	0	0
C3676_1	0	0	0	0
C4134_1	0	0	0	0
C3489_1	0	0	0	0
C3525_1	0	0	0	0
C2276_1	0	0	0	0
C2276_4	0	0	0	0
C2276_5	0	0	0	0
C2276_6	0	0	0	0
C3473_1	0	0	0	0
C3726_2	0	0	0	0
C3670_1	0	0	0	0
C3700_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3457_1	0	0	0	0
C3714_1	0	0	0	0
C2241_1	0	0	0	0
C2242_1	0	0	0	0
C3611_1	0	0	0	0
C4029_1	0	0	0	0
C3581_1	0	0	0	0
C3711_1	0	0	0	0
C3711_2	0	0	0	0
C3711_3	0	0	0	0
C3677_1	0	0	0	0
C3677_2	0	0	0	0
C2929_1	0	0	0	0
C3682_1	0	0	0	0
C3493_1	0	0	0	0
C3543_1	0	0	0	0
C3484_1	0	0	0	0
C3519_1	0	0	0	0
C4043_1	0	0	0	0
C3568_1	0	0	0	0
C5271_3	0	0	0	0
C5271_4	0	0	0	0
C5271_5	0	0	0	0
C3585_1	0	0	0	0
C3586_1	0	0	0	0
C3587_1	0	0	0	0
C3588_1	0	0	0	0
C3589_1	0	0	0	0
C3590_1	0	0	0	0
C2240_1	0	0	0	0
C4169_1	0	0	0	0
C4169_2	0	0	0	0
C4347_1	0	0	0	0
C3442_1	0	0	0	0
C3498_1	0	0	0	0
C2205_1	0	0	0	0
C3594_1	0	0	0	0
C3619_1	0	0	0	0
C4021_1	0	0	0	0
C4021_2	0	0	0	0
C5343_1	0	0	0	0
C5343_2	0	0	0	0
C3494_1	0	0	0	0
C3501_1	0	0	0	0
C3532_1	0	0	0	0
C2848_1	0	0	0	0
C2849_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3536_1	0	0	0	0
C3546_2	0	0	0	0
C4016_1	0	0	0	0
C3613_1	0	0	0	0
C3552_1	0	0	0	0
C2846_2	0	0	0	0
C2208_1	0	0	0	0
C2208_2	0	0	0	0
C3645_1	0	0	0	0
C3610_1	0	0	0	0
C3767_1	0	-0.02	0	0.02
C3609_1	0	0	0	0
C3535_1	0	0	0	0
C3608_1	0	0	0	0
C2206_1	0	0	0	0
C2207_1	0	0	0	0
C3569_1	0	0	0	0
C3707_2	0	0	0	0
C5268_1	0	0	0	0
C5276_1	0	0	0	0
C3722_1	0	0	0	0
C4213_6	0	0	0	0
C4213_9	0	0	0	0
C5290_1	0	0	0	0
C4097_1	0	0	0	0
C4024_1	0	0	0	0
C3679_1	0	0	0	0
C4025_1	0	0	0	0
C4025_2	0	0	0	0
C4026_1	0	0	0	0
C4017_1	0	0	0	0
C4018_1	0	0	0	0
C4084_1	0	0	0	0
C4084_2	0	0	0	0
Depletion 5165	0	0	0	0
Lumped Dep 5165	0	0	0	0
C2946_1	0	-0.04	0	0.16
C5298_1	0	0	0	0
C4360_3	0	-0.06	0	0.06
C5274_1	0	0	0	0
C4003_1	0	0	0	0
C4069_1	0	0	0	0
C4085_1	0	-0.02	0.29	0.25
C4085_2	0	-0.04	0.58	0.26
C5292_1	0	0	0	0
C3671_1	0	0	0	0
C3672_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3674_1	0	0	0	0
C3673_1	0	0	0	0
C4217_1	0	0	0	0
C2944_1	0	0	0	0
C3685_1	0	0	0	0
C4185_1	0	0	0	0
C3497_1	0	0	0	0
C4086_1	0	0	0	0
C3629_1	0	0	0	0
C5328_10	0	-0.01	0	0
C3684_1	0	0	0	0
C3683_1	0	0	0	0
C4106_3	0	0	0	0
C3659_2	0	0	0	0
C4007_1	0	0	0	0
C4333_1	0	0	0	0
C3644_1	0	0	0	0
C5345_3	0	0	0	0
C5345_4	0	0	0	0
C3637_2	0	0	0	0
C3664_1	0	0	0	0
C2958_1	0	0	0	0
C2958_2	0	0	0	0
C2958_3	0	0	0	0
C3729_1	0	0	0	0
C5308_1	0	0	0	0
Depletion 5158	0	0	0	0
Lumped Dep 5158	0	-1.02	0.83	0
C4048_1	0	0	0	0
C4048_2	0	0	0	0
C3686_1	0	0	0	0
C3687_1	0	0	0	0
C5357_7	0	0	0	0
C5357_8	0	0	0	0
C2211_1	0	0	0	0
C4105_1	0	0	0	0
C4105_2	0	0	0	0
C5311_1	0	0	0	0
C3768_2	0	-0.02	0	0.02
C3455_2	0	0	0	0
C2954_1	0	0	0	0
C4184_1	0	0	0	0
C3462_1	0	0	0	0
C3759_1	0	0	0	0
C3759_2	0	-0.01	0	0
C2209_1	0	0	0	0
C4036_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C3727_1	0	0	0	0
C5273_1	0	0	0	0
C3681_1	0	0	0	0
C4349_1	0	-0.06	0	0.03
C4349_2	0	-0.05	0	0.05
C4349_3	0	-0.07	0	0.14
C3411_1	0	0	0	0
C4024_2	0	0	0	0
C3665_1	0	0	0	0
C3680_1	0	0	0	0
C2943_1	0	0	0	0
C4211_3	0	0	0	0
C5325_2	0	0	0	0
C5325_3	0	0	0	0
C2315_3	0	0	0	0
C3685_2	0	0	0	0
Depletion 5165b	0	0	0	0
Lumped Dep 5165b	0	-0.07	0.57	0
C2273_1	0	0	0	0
C2273_2	0	0	0	0
P3763_1	0	0	0	0
P3762_1	0	0	0	0
P3761_1	0	0	0	0
C3707_3	0	0	0	0
C3707_4	0	0	0	0
C4372_1	0	0.03	0	-0.01
C4372_2	0	0.21	-0.15	-0.03
P3813_1	0	0	0	0
C5362_1	0	0	0	0
P4146_1	0	0	0	0
P3851_1	0	0	0	0
C4040_2	0	0	0	0
C4358_1	0	0.14	-0.14	-0.01
C4359_2	0	0.06	-0.15	-0.01
P3915_1	0	0	0	0
C5312_1	0	0	0	0
P4124_1	0	0	0	0
P4124_2	0	0	0	0
Depletion 5157	0	0	0	0
Lumped Dep 5157	0	45.3	-0.37	-0.2
P3936_1	0	0.58	-0.29	-0.02
C3007_2	0	0	0	0
P4000_1	0	0	0	0
P4003_1	0	0	0	0
P4002_1	0	0	0	0
P4002_2	0	0	0	0
P4015_1	0	0	0	0

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
P4015_2	0	0	0	0
P4014_1	0	0.42	-0.29	-0.02
P3939_1	0	0	0	0
C4355_7	0	0	0	0
P4013_1	0	0.27	-0.29	-0.02
P4012_1	0	0	0	0
P4017_1	0	0	0	0
C5286_2	0	0	0	0
C5286_3	0	0	0	0
C5286_4	0	0	0	0
C5285_1	0	0.36	-0.14	-0.05
P4011_1	0	0.43	-0.15	-0.05
P4011_2	0	0.24	-0.15	-0.05
P4016_2	0	2.15	-0.14	-0.05
P4016_1	4.2	4.19	-1.35	-6.73
P4024_1	0	0	0	0
P4042_1	0	0.15	-0.28	-0.02
P4023_1	0	0.08	-0.15	-0.02
C4371_2	0	0.04	-0.15	-0.02
P4009_1	0	0	0	0
P4010_2	0	0	0	0
P4135_1	0	0	0	0
P4035_1	0	0	0	0
P4064_1	0	0	0	0
P4063_1	0	0.01	0	0
P4063_2	0	0.01	0	0
P4080_1	0	0.21	-0.15	-0.02
P4078_1	0	0.12	-0.14	-0.02
C4363_2	0	0.15	-0.14	-0.01
C4366_2	0	0.02	-0.14	-0.01
P4076_1	0	0.03	-0.14	-0.01
P4095_1	0	0	0	0
P4109_1	0	2.52	-0.57	-0.63
P4016_3	0	10.12	-1.01	-1.03
C2953_1	0	0.5	-0.43	-0.56
C2953_2	0	0.42	-0.43	-0.56
C2953_3	0	0.39	-0.43	-0.56
C5346_5	0	0	0	0
P4128_1	0	1.16	-1.01	-1.14
P4201_1	0	0	0	0
P4145_1	0	5.08	-1.01	-1.14
P4132_1	0	0	0	0
C5349_3	0	0	0	0
C5349_4	0	0	0	0
P4166_1	0	0.69	-0.43	-0.58
C5355_3	0	0	0	0
P4216_1	0	0	0	0



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
P4216_2	0	0	0	0
P4218_1	0	0	0	0
P4212_1	0	1.72	-0.43	-0.58
P4221_1	0	0	0	0
P4232_1	0	3.85	-0.28	-0.44
P4258_1	0	1.33	-0.43	-0.19
P4266_1	0	0	0	0
P4279_1	0	3.46	-0.43	-0.57
P4279_2	0	0.29	-0.15	-0.19
P4296_1	0	0.03	-0.14	-0.03
P4296_2	0.1	0.04	-0.02	-0.02
P4296_3	0	0.06	-0.28	-0.01
P4280_1	0	0.19	-1.86	-1.95
P5000_1	0	0	0	0
C5292_2	0	0	0	0
C5338_2	0	0	0	0
P5023_1	0	0	0	0
P5023_2	0	0	0	0
C3470_5	0	0	0	0
C3470_6	0	0	0	0
C3470_7	0	0	0	0
C3470_8	0	0	0	0
C5343_3	0	0	0	0
C5343_4	0	0	0	0
P5076_1	0	0.13	-0.43	-0.53
P5077_1	0	6.89	-1.15	-1.15
P5085_1	0	37.47	-1.15	-0.62
P5094_1	0	0	0	0
P5148_1	0	0.15	0	-0.03
P5162_1	0	0	0	0
P5164_1	0	0.01	0	0
P5094_2	0	0	0	0
C5307_2A	-2	92.99	-0.72	-0.58
C5307_4	-43.5	0	0	0
P5230_1	0	0	0	0
P5242_1	0	4.55	-0.29	-0.29
P5256_1	0	0	0	0
P5282_1	0	0.68	-0.29	-0.3
P5290_1	0	0.09	0	-0.04
P5290_2	0	8.63	-1.58	-1.44
P5319_1	0	0	0	0
P5329_1	0	0.25	0	-0.08
P5329_2	0.2	0.25	0	0
P5330_1	0	0.51	-0.29	-0.27
P5354_1	0	0.56	0	-0.29
P5359_1	0	0	0	0
P5385_1	0	1.07	-0.72	-0.77

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
C4024_3	0	0	0	0
P5405_1	0	0	0	0
P5435_1	0	0.69	-0.29	-0.29
P5458_1	0	0	0	0
P5473_1	0	0.08	-0.86	-0.89
P5533_2	0	0	0	0
P5551_4	0	0	0	0
P5552_1	0	3.35	-0.15	-0.14
C3705_3	0	0	0	0
P5567_1	0	1.46	-0.15	-0.07
P5566_1	0	4.02	-2.3	-1.61
P5570_1	0	5.6	-1.29	-1.54
P4095_2	0	1.65	-0.28	-0.53
METEST	0	0.04	-0.28	-0.28
25TEST	0	0.17	-1.43	-1.43
Depletion 2925	0	0	0	0
Lumped Dep 2925	0	947.9	-5.84	-2.6
P5677_1	0	0	0	0
P5686_1	0	0	0	0
C5332_1	0	72.18	-0.15	-0.14
P5692_1	0	0.1	-0.15	-0.15
C3775_4	0	10.73	-0.86	-2.14
P5744_1	0	0	0	0
P5744_2	0	0	0	0
P5752_1	0	7.47	-0.43	-0.62
P5759_1	0	0.01	-0.29	-0.09
C4107_2	-0.4	-0.47	0.07	0.05
P5767_1	0	0	0	0
P5770_1	0	0	0	0
P3809_4	0	0	0	0
C2991_2	0	0	0	0
P5791_1	0	0	0	0
P5803_1	0	0	0	0
P5816_1	0	0	0	0
PSMT2_LS_MUN	0	0	0	0
PSMT2_LS_IND	0	0	0	0
PSMT2_LS_IRR	0	0	0	0
PSMT2_LS_MIN	0	0	0	0
PSMT2_US	0	0	0	0
PCTT2_LS_MUN	0	0	0	0
PCTT2_LS_IRR	0	0	0	0
GBYT2_LS_MUN	0	0	0	0
GBYT2_LS_IND	0	0	0	0
GBYT2_LS_LUM	0	0	0	0
GBYT2_LS_IRR	0	0	0	0
GBYT2_LS_MIN	0	0	0	0
WTVT2_LS_MUN	0	88.39	-1.15	-0.79

NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
WYTY2_LS_IRR	88.4	0	0	0
ALAT2_LS_MUN	0	0	0	0
BLNT2_LS_MUN	0	0	0	0
BLNT2_LS_MUN2	0	0	0	0
BLNTSTIT_SYS_MUN	0	-5.75	0.15	0.15
BLNTSTIT_SYS_BU	-5.8	0	-0.67	-0.67
STIT2_LS_MUN	0	0	0	0
STIT2_LS_IRR	0	0	0	0
GGLTGLKT_SYS_MUN	0	-9.9	0.28	0.07
GGLTGLKT_SYS_BU	-9.9	-9.9	0	0
GGLTSTIT_SYS_MUN	-9.9	-16.36	0.15	0.08
GGLTSTIT_SYS_BU	-16.4	-5.04	0	0.06
GGLT2_LS_MUN	-5.1	0	0	0
GLKT2_LS_MUN	0	0	0	0
GLKT2_LS_IRR	0	0	0	0
SOMT2_LS_MUN	0	0	0	0
LLST2_LS_MUN	0	0.22	-0.14	-0.11
LLST2_LS_IND	0	89.07	-0.43	-0.18
C5155_DPRETQ	190.2	0	0	0
C5156_DPRETQ	110.6	0	0	0
C5157_DPRETQ	-11.4	0	0	0
C5158_DPRETQ	-10.9	0	0	0
C5159_DPRETQ	0	0	0	0
C5160_DPRETQ	0	0	0	0
C5161_DPRETQ	2.6	0	0	0
C5162_DPRETQ	5.1	0	0	0
C5163_DPRETQ	0	0	0	0
C5164_DPRETQ	195.5	0	0	0
C5165_DPRETQ	20.8	0	0	0
ALLENS_DPRETQ	-380.3	0	0	0
PLOT2_DS_IND	0	1.72	-0.14	-0.14
DNNT2_DS_IRR	0	0.03	0.29	-0.06
DNNT2_DS_MIN	0	1.42	-0.14	-0.14
GBYT2_DS_IRR	0	0	0	0
GBYT2_DS_MIN	0	0	0	0
WYTY2_DS_LIM	369.1	0	0	0
WYTY2_DS_IND	0	132.87	-0.86	-1.13
WYTY2_DS_INDSYS	132.9	0	0	0
BLNT2_DS_TEMPLE	0	0	0	0
BLNT2_DS_IRR	0	0	0	0
STIT2_DS_IRR	0	0	0	0
LLST2_DS_LIM	52.2	0	0	0
LLST2_DS_MUN	0	13.6	-0.43	-0.34
LLST2_DS_TMPA	0	15.52	-0.43	-0.43
HIBT2_DS_MUN	0	2.86	-0.14	-0.12
YEGBR_DS_LIM	41.3	0	0	0
YEGBR_DS_MUN	0	2.98	-0.14	-0.12



NAME	Difference in Target Diversion (Ac-Ft/Yr)	Difference in Mean Shortage (Ac-Ft/Yr)	Difference in % Reliability	
			Period	Volume
BBZT2_DS_IRR	0	0.11	-0.15	-0.06
YEGBR_DS_IRR	0	0.08	-0.14	-0.06
GLKT2_DS_IND	0	0	0	0
NAVBR_DS_IRR	0	0	0	0
RMOT2_SYS_LIM	3671.1	0	0	0
RMOT2_SYS_IRR	0	0	0	0
ROST2_SYS_LM1	-13637.7	0	0	0
ROST2_SYS_RORTRK	-13062.8	0	0	0
ROST2_SYS_LIM	-13062.8	0	0	0
ROST2_SYS_MUN	0	0	0	0
RMOT2_SYS_NRG	0	0	0	0
RMOT2_SYS_NRG2	0	0	0	0
ROST2_SYS_GCWA	0	0	0	0
ROST2_SYS_DOW	0	0	0	0
ROST2_SYS_FIXED	0	0	0	0
ROST2_SYS_YIELD	0	0	0	0
P5899_2	0	0	0	0
P5931_2	0	-0.75	0.14	0.08
1BUCLIF_MERI	0	0	0	0
C5157_2	8.5	0	0.31	0.2
WHITHYDRO	-1051.2	125.08	0	-0.11
TARGET_EXCESS	2692	0	0	0

## **Attachment 13**

Addendum to Administrative Information Report:  
Signatory Authority



Gulf Coast Water Authority

Certified Copy

State of Texas  
County of Galveston

I, Renee Dondonay, District Secretary for Gulf Coast Water Authority, hereby certify that the attached and foregoing pages contain a just, true, correct and complete copy of:

The Bylaws of the Gulf Coast Water Authority

Given under my hand and seal of said Authority, this 8<sup>th</sup> day of August, 2018.

*Renee Dondonay*

Renee Dondonay, District Secretary  
Gulf Coast Water Authority





**Amended and Restated By-Laws  
Of  
Gulf Coast Water Authority**

Adopted July 19, 2007;  
Amended December 20, 2012;  
Amended April 16, 2015; and  
Amended April 21, 2016.

**ARTICLE I  
BOARD OF DIRECTORS**

**Section 1. Number and Term of Office; Appointment.** The management and control of the Authority is vested in its Board of Directors, which shall have all of the rights, powers, privileges, and authority set out in Article 8280-339, Vernon's Texas Civil Statutes, as now or hereafter amended, and under the other laws of the State of Texas.

- a) The Board of Directors shall consist of ten directors. Each director shall be appointed and shall serve a term of office as provided by Article 8280-339 (see Exhibit A attached).

Directors whose terms end August 31, Even Number Years:

- \*Brazoria County Agricultural Position No. 1;
- \*Brazoria County Industrial Position No. 1;
- \*Fort Bend County At Large Position No. 1;
- \*Galveston County At Large Position No. 2; and
- \*Galveston County Industrial Position No. 2.

Directors whose terms end August 31, Odd Number Years:

- \*Brazoria County Municipal Position No. 1;
- \*Fort Bend County Municipal Position No. 1;
- \*Galveston County At Large Position No. 1;
- \*Galveston County Industrial Position No. 1; and
- \*Galveston County Municipal Position No. 1.

- b) Each director shall serve for the term for which the director is appointed and until a successor is appointed and qualified.

**Section 2. Meetings of Directors.** Regular meetings of the Board will be held at the Authority's principal office (as defined in Article V, Section 1 below), or at such other place as the Board may from time to time designate. The Board may hold special meetings at the place designated in the notice of such meeting.

**Section 3. Election of Officers.** At the first regular board meeting after September 1 or a later date as established by the Board, the Board of Directors shall elect the officers of the Board.

**Section 4. Regular Meetings.** Regular meetings of the Board of Directors shall be held on the third Thursday of each month, or such other date as may be established by the Board from time to time and recorded in its minutes.

**Section 5. Special Meetings.** Special meetings of the Board of Directors shall be held whenever called by the President or by no less than three of the directors.

**Section 6. Notice.** Notice of all meetings of the Authority and its committees shall be posted in accordance with applicable law. Except as may be allowed by law, an item may not be considered unless it is posted as part of a meeting agenda or supplemental meeting agenda. Agendas for Board meetings are prepared and posted by the General Manager or the General Manager's designee, and no items may be placed on an agenda unless approved by the General Manager, President, or three board members; provided that, agendas for Board committees must additionally be approved by the applicable committee chairman.

**Section 7. Quorum.** A majority of the directors shall constitute a quorum for the transaction of business, but if at any meeting of the Board there be less than a quorum present, a majority of those present or any director solely present may adjourn the meeting from time to time without further notice. The act of a majority of the entire membership of the board of directors shall be the act of the Board of Directors unless the act of a greater number is required by law.

**Section 8. Order of Business.** The Board of Directors is the sole judge of its own procedure and in full control of the business before it. At meetings of the Board of Directors, business shall be transacted in such order as from time to time the Board may determine.

At all meetings of the Board of Directors, the President shall preside. In case of the absence or disability of the President, the President shall be succeeded in order by the Vice President, the Secretary, the Treasurer, and the Assistant Secretary, who shall act as President. In case of the absence or disability of all of the above-named officers, the Board shall vote for one of its members to preside over the meeting. Any action taken by the Vice President, Secretary, Treasurer or Assistant Secretary in the performance of the duties of President shall be conclusive evidence of the absence or inability to act, at the time such action is taken, of the officer or officers otherwise authorized to perform the duties of President.

**Section 9. Public Participation.** Meetings of the Board and Board committees are open to the public, except where a closed meeting is authorized by law. A speaker may address the Board or Board committee during the public comment portion of the agenda. Such designated time shall not exceed three (3) minutes per person. The President, or presiding officer, shall retain the discretion to further limit or increase this time for public comments on agenda items. Employees, customers, and consultants of the Authority requested by the General Manager or a Board Member may be recognized at any time by the presiding officer of the Board or Board committee meeting without restriction. These rules regarding speaker participation may be suspended by a majority vote of the Board, or the Board committee, as applicable.

**Section 10. Compensation, Expenses.** Directors are entitled to receive compensation as permitted in accordance with Texas Water Code§ 49.060.

Each director is entitled to receive reimbursement of actual expenses reasonably and necessarily incurred while engaging in activities on behalf of the Authority. In order to receive fees of office and to receive reimbursement for expenses, each director shall file with the General Manager

a verified statement showing the number of days actually spent in the service of the Authority, and a general description of the duties performed for each day of service. To receive reimbursement of actual expenses reasonably and necessarily incurred while traveling on Authority business, the director must follow and abide by the Authority's Board Travel Policy.

**Section 11. Decorum.** Each member of the Board shall be permitted to speak upon recognition by the President, and, after recognition, shall not be interrupted while speaking without the President's consent. Any member who fails to observe decorous and orderly behavior during a meeting, or who disturbs a meeting of the Board or committee with such disorderly conduct is subject to reprimand, discipline or expulsion from the meeting, upon 2/3 vote of the Board.

**Section 12. Handling of Questions of Order.** All questions of order shall be decided by the President, with the right of appeal of the President's decision by the Board. A majority of the Board may overrule the decision of the President.

**Section 13. Motion to Table.** A motion to table, when carried, does not permanently defeat a motion or other measure. If such motion or measure is tabled by a majority vote of the Board, such motion or measure, if not sooner removed from the table, must be removed at the third subsequent meeting and acted upon, even if only to place the item on the table again.

## **ARTICLE II** **OFFICERS**

**Section 1. Number, Titles and Terms of Office.** The officers of the Authority shall be President, Vice President, Secretary, Treasurer and Assistant Secretary. Each officer shall hold office until the officer's successor shall have been duly elected and qualified.

**Section 2. Vacancies.** A vacancy in the office of any officer may be filled by vote of a majority of the directors for the unexpired portion of the term.

**Section 3. Powers and Duties of the President.** The President shall preside at all meetings of the Board of Directors and shall execute all documents that require approval by the Board of Directors except when such authority is specifically delegated by the Board to the General Manager or other officer or employee.

**Section 4. Vice President.** The Vice President shall have such powers and duties as may be assigned to the Vice President by the Board of Directors and shall exercise the powers of the President during that officer's absence or inability to act.

**Section 5. Secretary; Assistant Secretary.** The Secretary (the "Secretary") may sign with the President in the name of the Authority all contracts of the Authority and may affix the official seal of the Authority thereto; and the Secretary shall in general perform all duties incident to the office of Secretary subject to the control of the Board of Directors, including attending any training required by law. The Assistant Secretary shall exercise the powers of the Secretary during the Secretary's absence or inability to act.

**Section 6. Treasurer.** The Treasurer shall in general perform all duties incident to the office of Treasurer subject to the control of the Board of Directors, including attending any training required



by law.. The Treasurer shall serve as Chair of the Board Finance and Insurance Committee.

**Section 7. General Manager.** The Board may employ a General Manager to be the Chief Executive Officer of the Authority and give the General Manager full authority in the management and operation of the affairs of the Authority subject only to the orders of the Board. The authority granted to the General Manager shall include, but is not limited to, the following:

- a) the negotiation of contracts;
- b) to be the Authority's representative in all legal matters;
- c) the implementation of all policies and direction approved by the Board;
- d) speaking publicly on behalf of the Authority;
- e) representing the Authority before all public agencies;
- f) preparation of the annual budget and presentation to the Board;
- g) to be the final authority in all personnel matters including application of personnel policies and pay plan as approved by the Board;
- h) responsibility for all financial and accounting matters, including the authority to make purchases up to \$ 75,000 without Board approval.
- i) The General Manager or a designee of the General Manager shall act as clerk to the Board. The clerk shall cause the minutes of each minutes of the Board to be kept and filed.

The term, compensation, and duties, of the General Manager may be set out in an agreement executed by the Board and the General Manager.

### **ARTICLE III** **BOARD COMMITTEES**

**Section 1. Appointment.** The President may from time to time appoint committees of the Board for the purpose of considering particular matters related to the Authority and its operations. Such committees may be standing committees which continue in existence or ad hoc committees which cease to exist when the purpose for which that are appointed has be accomplished. All appointments to Board committees shall be recorded in the minutes of the Board. Committee membership is limited to Board members.

The Board committees shall have no power to act on behalf of the Board. The powers of Board committees shall be limited to making such reports and recommendations to the Board at posted Board meetings where a quorum is present, together with an explanation of the reasons for any such recommendation. Decisions on matters referred to Board committees shall be made only by the Board of Directors. Each Board committee is responsible for recording its own minutes and forwarding same to staff for distribution to all Board members in a timely manner.

Board committees should meet only as needed and as called by the Committee Chairperson.

At the time of adoption of these Bylaws the standing Board committees are the Capital Projects Review, Finance and Insurance, Long Range Planning, Personnel and Compensation, and Safety committees. The standing Board committees are created for the following purposes:

- a) Capital Projects Review Committee - Purpose Statement - To review with staff engineering reports and capital improvement projects, and make recommendations in a posted meeting of the Board.
- b) Finance and Insurance Committee - Purpose Statement - To review with staff quarterly financial reports, and review audit reports prepared by external auditors, and annually review investment policy, and make recommendations in a posted meeting of the Board.
- c) Long Range Planning Committee - Purpose Statement - To assess the long range organizational, management, and planning needs of the Authority, and recommend modifications and/ or additions in a posted meeting of the Board.
- d) Personnel and Compensation Committee - Purpose Statement - To review personnel policies and benefits and make recommendations in a posted meeting of the Board.
- e) Safety Committee - Purpose Statement - To quarterly or as needed review accident and incident reports, employee safety training programs, and safety policies, and make recommendations in a posted meeting of the Board.

**Section 2. Composition.** Board committees shall be composed of not less than three nor more than five Board Members, , one of whom shall be designated as Chairman by the President of the Board, except for the Finance and Insurance Committee which shall be chaired by the Treasurer. Vacancies on a Board committee shall be filled by appointment by the President of the Board.

**Section 3. Proceedings and Powers.** Board committees may meet at such times and places as the committee members may determine and the members of each committee shall determine the order of business at its meetings.

#### **ARTICLE IV** **CUSTOMER COMMITTEES**

**Section 1. Standing Customer Operating Advisory Committees.**

a) The Authority has four customer operating advisory committees: the Industrial Operating Advisory Committee and the Municipal Division Operating Advisory Committee, Agricultural Advisory Committee and the West Customer Advisory Committee.

b) Industrial Operating Advisory Committee. The Industrial Operating Advisory Committee is a standing customer advisory committee which is established by contract, and is composed of one representative of each industrial customer of the Authority in Galveston County. The name of the representative of each industrial customer shall be submitted to the Authority as their official representative. The representative of the industrial customer to the Industrial Operating Advisory Committee shall also be the representative of such customer to the standing Industrial Advisory Committee described above unless such customer chooses to appoint a different representative. Each representative shall serve at the pleasure of the appointing customer and shall serve until the appointing customer appoints a successor or notifies the Authority that a representative will no longer be the representative of such appointing customer. The Authority will solicit the advice and counsel of this Committee in regard to the operation, maintenance, repair, replacement, and enlargement of the Industrial System. This Committee will be advised on matters involving the GCWA Canal Systems. The Authority will also provide this Committee with drafts of any contracts for the purchase of additional long-term water supplies for the Industrial Customers, and drafts of the annual budget, both prior to consideration by the Authority's Board of Directors

c) Municipal Division Operating Advisory Committee. The Municipal Division Operating Advisory Committee is a standing customer advisory committee which is established by contract, and is composed of one representative of each municipal or water district customer of the Authority's Thomas Mackey Water Treatment Plant. The name of the representative of each eligible municipal or water district customer shall be submitted to the Authority as their official representative. Each representative shall serve at the pleasure of the appointing customer and shall serve until the appointing customer appoints a successor or notifies the Authority that a representative will no longer be the representative of such appointing customer. The Authority will solicit the advice and counsel of this Committee in regard to the operation, maintenance, repair, replacement, and enlargement of the Mainland Water System which serves all customers within Galveston County. This Committee will be advised on matters involving the GCWA Canal Systems. The Authority will also provide this Committee with drafts of any contracts for the purchase of additional long-term water supplies for the Municipal Division, and, drafts of the annual budget, both prior to consideration by the Authority's Board of Directors.

d) West Customers Advisory Committee. The West Customers Advisory Committee is a standing customer advisory committee which is established by the Board of Directors to be advised on matters involving the GCWA Canal Systems that provide water for municipal, and industrial, purposes in Fort Bend and Brazoria Counties. The name of the representative of each eligible municipal, water district, and industrial customer shall be submitted to the Authority as their official representative. Each representative shall serve at the pleasure of the appointing customer and shall serve until the appointing customer appoints a successor or notifies the Authority that a representative will no longer be the representative of such appointing customer. Additionally, the West Customers Committee shall be advised on additional long-term water supplies for Fort Bend and Brazoria County customers, and, drafts of the annual budget, both prior to consideration by the Authority's Board of Directors.

e) Agriculture Advisory Committee. The Agricultural Advisory Committee is a standing customer advisory committee which is established by the Board of Directors to be advised on matters involving the GCWA Canal Systems that provide water for irrigation purposes in Galveston, Fort Bend, and Brazoria Counties. Active farmers who have contracted for irrigation water with the Authority at least once in the previous three years may vote among themselves and select five farmers as their representatives to the Agricultural Committee. The names shall be submitted to the Authority



as their official representatives. Each representative shall serve at the pleasure of the appointing farmers and shall serve until the appointing farmers appoints a successor or notifies the Authority that a representative will no longer be their representative. The Agricultural Advisory Committee may advise the Board regarding the quantity of interruptible stored water needed for the upcoming planting season.

**Section 4. Other Committees.** The Board may from time to time establish other customer advisory committees on such terms and conditions as the Board may determine.

## **ARTICLE V**

### **MISCELLANEOUS PROVISIONS**

**Section 1. Offices.** Until the Board of Directors otherwise determines, the principal Office of the Authority shall be at 3630 Highway 1765, Texas City, Texas, but such office may be changed from time to time by the Board of Directors in the manner provided by law. The records of the District shall be maintained at such office. The Board may establish other offices of the Authority from time to time.

**Section 2. Fiscal Year.** The fiscal year of the Authority shall be such annual period as the Board of Directors shall, by resolution, establish.

**Section 3. Seal.** The seal of the Authority shall be in such form as from time to time may be approved by the Board of Directors.

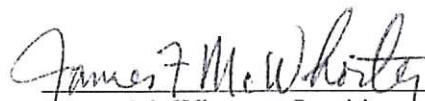
## **ARTICLE VI**

### **AMENDMENTS**

These by-laws may be altered, amended, or repealed by the affirmative vote of a majority of the full Board of Directors at any regular or special meeting, provided notice of said proposed amendment is contained in the notice of meeting.

ADOPTED the 21st day of April 2016.



  
James McWhorter, President

  
Eric Wilson, Secretary

EXHIBIT A: Article 8280-339, Vernon's Texas Civil Statutes, attached.

**The Gulf Coast Water Authority**  
*Enabling Legislation*

Originally Codified as  
**Article 8280-339, Vernon's Texas Civil Statutes**

Chapter 712, Acts of the 59<sup>th</sup> Legislature of the  
State of Texas, Regular Session, 1965 (H.B. No. 1127)

**And As Amended By**

Chapter 399, Acts of the 61<sup>st</sup> Legislature of the  
State of Texas, Regular Session, 1969 (H.B. No. 1383);

Chapter 708, Acts of the 66<sup>th</sup> Legislature of the  
State of Texas, Regular Session, 1979 (H.B. No. 165);

Chapter 1049, Acts of the 68<sup>th</sup> Legislature of the  
State of Texas, Regular Session, 1983 (H.B. No. 2343);

Chapter 818, Acts of the 72<sup>nd</sup> Legislature of the  
State of Texas, Regular Session, 1991 (H.B. No. 2837);

Chapter 683, Acts of the 73<sup>rd</sup> Legislature of the  
State of Texas, Regular Session, 1993 (H.B. No. 2177);

Chapter 1259, Acts of the 82<sup>nd</sup> Legislature of the  
State of Texas, Regular Session, 2011 (S.B. No. 683);

Acts of the 84<sup>th</sup> Legislature of the State of Texas,  
Regular Session, 2015 (H.B. 4168).

Compiled by Olson & Olson, L.L.P.,  
June 5, 2015.

## AN ACT

creating a Conservation and Reclamation District under the provisions of Section 59, Article XVI, Constitution of Texas, to be known as "Galveston County Water Authority of Galveston County, Texas"; prescribing its rights, powers, privileges, duties; providing said District shall have no power to levy taxes; providing other limitations on the District's powers; providing that the District shall bear the sole expense of the relocation of certain facilities under the provisions of this Act; providing for its governing body; providing that its bonds are legal and authorized investments; containing provisions relating to revenue bonds of the District; containing other provisions relating to the subject; providing a severability clause; and declaring an emergency.

### BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

Section 1. Under and pursuant to the provisions of Section 59 of Article XVI, Constitution of Texas, a Conservation and Reclamation District is hereby created and incorporated, to be known as the Gulf Coast Water Authority, hereinafter referred to as "District," which shall be a governmental agency and body politic and corporate and a municipal corporation.

Sec. 2. The District shall be comprised of all of the territory contained within Galveston County, Texas, and its boundaries shall be the same as and coextensive with the boundaries of Galveston County, Texas.



Sec.3. Except as expressly limited by this Act, the District shall have and exercise and is hereby vested with all rights, powers, privileges, and authority conferred by the General Laws of this State now in force or hereafter enacted applicable to municipal utility districts created under authority of Section 59 of Article XVI, Constitution of Texas including without limitation those conferred by Chapter 54, Water Code, as amended, but to the extent that the provisions of such General Laws may be in conflict or inconsistent with the provisions of this Act, the provisions of this Act shall prevail. All such General Laws are hereby adopted and incorporated by reference with the same effect as if incorporated in full in this Act. Without in any way limiting the generalization of the foregoing, it is expressly provided that the District shall have, and is authorized to exercise, the following rights, powers, privileges and functions:

(a) the power to make, construct, or otherwise acquire improvements either within or without the boundaries thereof necessary to carry out the powers and authority granted by this Act and said General Laws and to exercise the power of eminent domain for such purposes; provided, however, that the District shall not have the power of eminent domain as to all or any part of the water supply, property, works or facilities of any private person or persons, or of any private or public corporation or association engaged in the business of supplying water in Galveston County, Texas, to any class of consumers for any use upon the effective date of this Act, but this provision shall not restrict the power of the District to acquire necessary crossing easements and rights of way;

(b) to conserve, store, transport, treat and purify, distribute, sell and deliver water, both surface and underground, to persons, corporations, both public and private, political subdivisions of the State and others, and to purchase, construct or lease all property, works and facilities, both within and without the District, necessary or useful for such purposes;

(c) to acquire water supplies from sources both within or without the boundaries of the District and to sell, transport and deliver water to customers situated within or without the District and to acquire all properties and facilities necessary or useful for such purposes, and for any or all of such purposes to enter into contracts with persons, corporations, both public and private, and political subdivisions of the State for such periods of time and on such terms and conditions as the Board of Directors may deem desirable;

(d) subject to the provisions of this Act, to sell, lease, or exchange any property of any kind, or any interest therein, which is not necessary to the carrying on of the business of the District or the sale, lease or exchange of which, in the judgment of the Board of Directors, is necessary for the exercise of the powers, rights, privileges, and functions conferred upon the District by this Act or by Chapter 54, Water Code, as amended;

(e) subject to the provisions of this Act, to acquire by purchase, lease, gift, or otherwise, and to maintain, use, and operate any and all property of any kind, or any interest therein, within or without the boundaries of the District, necessary to the exercise of the powers, rights, privileges, and functions conferred by the Act or by Chapter 54, Water Code, as amended;

(f) to construct, extend, improve, maintain, and reconstruct, to cause to be constructed, extended, improved, maintained, and reconstructed, and to use and operate, any and all facilities of any kind necessary to the exercise of such powers, rights, privileges, and functions;

(g) to sue and be sued in its corporate name;

(h) to adopt, use and alter a corporate seal;

(i) to invest and reinvest its funds;

(j) to make bylaws for management and regulation of its affairs;

(k) to appoint officers, agents, and employees, to prescribe their duties and fix their compensation;

(l) to make contracts and to execute instruments necessary to the exercise of the powers, rights, privileges, and functions conferred by this Act or Chapter 54, Water Code, as amended, for such term and with such provisions as the Board of Directors may determine to be in the best interests of the District, including, without in any way limiting the generality of the foregoing, contracts with persons including the State of Texas, the United States of America and any corporation or agency thereof and districts, cities, towns, persons, organizations, firms, corporations, or other entities as the Board of Directors may deem necessary or proper for or in connection with any of its corporate purposes;

(m) to borrow money for its corporate purposes and, without limiting the generality of the foregoing, to borrow money and accept grants from persons, including the State of Texas, the United States of America, or from any corporation, agency, or entity created or designated by the State of Texas or the United States of America, and in connection with any such loan or grant, to enter into such agreements as the State of Texas, the United States of America, or any such corporation, agency, or entity may require; and to make and issue its negotiable bonds or notes for money borrowed, in the manner and to the extent provided in this Act, and to refund or refinance any outstanding bonds or notes and to make and issue its negotiable bonds or notes therefore in the manner provided in this Act.

Sec. 3A. In connection with the acquisition of water, or the treatment, storage, or transportation of water, the district may enter into retail service agreements within the Electric Reliability Council of Texas for the purchase of electricity for the district's own use and may sell electricity in a sale or resale only by way of a registered power marketer or power generation company in accordance with applicable public utility commission rules and requirements of the Electric Reliability Council of Texas. An agreement entered into under this section may provide for a term of years and include provisions that the Board of Directors determines are in the best interest of the district, including provisions for the posting of collateral or payment of an early termination amount in the event of early termination.



Sec. 4. (a) The District shall have no power or authority to levy and collect taxes on any property real, personal or mixed, within the boundaries of said District, nor shall the District have power or authority to issue bonds or create indebtedness which would in any way be payable from ad valorem taxes levied upon property within said District; and provided further that said District shall have none of the powers conferred by General Law for the purposes of the collection, transportation, processing, disposal and control of domestic, industrial or communal wastes, and the gathering, conducting, directing and controlling of local storm waters, or other local harmful excesses of water.

(b) Nothing herein shall be construed as impairing or affecting the powers, authority, rights, or duties of any municipal corporation or conservation and reclamation district heretofore or hereafter created within, or partially within, the boundaries of the District or to require any such corporation or district to contract with the District for its water supply.

(c) In the event that the District in the exercise of the power of eminent domain or power of relocation, or any other power granted hereunder, makes necessary the relocation, raising, rerouting or changing the grade of, or altering the construction of, any highway, railroad, electric transmission line, telephone or telegraph properties and facilities, or pipeline, all such necessary relocation, raising, rerouting, changing of grade or alteration of construction shall be accomplished at the sole expense of the District. The term "sole expense" shall mean the actual cost of such relocation, raising, re-routing, or change in grade or alteration of construction in providing comparable replacement without enhancement of such facilities after deducting therefrom the net salvage value derived from the old facility.

(d) Nothing herein shall be construed as conferring any water rights on the District or as fixing any priority of rights.

(e) Nothing herein shall be construed as authorizing the District to make any regulation of the withdrawal of underground water.

(f) The powers, rights, privileges, and functions conferred upon the District shall be subject to the continuing rights of supervision by the State, which shall be exercised by the Texas Department of Water Resources, and the District shall obtain approval of its projects and they shall be supervised as provided by Sections 54.516 and 54.517, Water Code, as amended.

Sec. 5. The management and control of the District is hereby vested in a Board of 10 directors. Vacancies on the Board of Directors, whether by death, resignation or termination of the term of office, shall be filled by appointment by the commissioners court that appointed the director. All terms of office shall be for a period of two (2) years. Terms shall be staggered.

Sec.5(a). The directors of the district shall be appointed as follows:

(1) five directors appointed by the Galveston County Commissioners Court, one of whom represents municipal interests, two of whom represent industrial interests, and two of whom represent the county at large;

(2) two directors appointed by the Fort Bend County Commissioners Court, one of whom represents municipal interests, and one of whom represents the county at large; and

(3) three directors appointed by the Brazoria County Commissioners Court, one of whom represents agricultural interests, one of whom represents municipal interests, and one of whom represents industrial interests.

Sec. 5(b). A director appointed under Section 5(a) to represent municipal or industrial interests must be a customer of or represent an entity that is a customer of the district.

Sec. 6. The bonds of the District shall be and are hereby declared to be legal and authorized investments for banks, savings banks, trust companies, building and loan associations, savings and loan associations, insurance companies, fiduciaries, trustees and for the sinking fund of cities, towns, villages, counties, school districts, or other political corporations or subdivisions of the State of Texas. Such bonds shall be eligible to secure the deposit of any and all public funds of the State of Texas, and any and all public funds of cities, towns, village, counties, school districts, or other political corporations or subdivision of State of Texas; and such bonds shall be lawful and sufficient security for said deposits to the extent of their value, when accompanied by all unmatured coupons pertinent thereto.

Sec. 7. The District shall have power and is hereby authorized to issue, from time to time, bonds as herein authorized for any of its corporate purposes. Such bonds may either be (1) sold for cash, at public or private sale, at such price or prices as the Board shall determine, provided that the net effective interest rate, recalculated in accordance with Chapter 3, Acts of the 61<sup>st</sup> Legislature, Regular Session, 1969, as amended (Article 717k-2, Vernon 's Texas Civil Statutes), as now or hereafter amended shall not exceed ten (10) percent, or (2) issued on such terms as the Board of Directors shall determine in exchange for property of any kind, real, personal, or mixed, on any interest therein which the Board shall deem necessary for any such corporate purposes, or (3) issued in exchange for like principal amounts of other obligations of the District, matured or unmatured. The proceeds of sale of such bonds shall be deposited in such bank or banks or trust company or trust companies, and shall be sold out pursuant to such terms and conditions, as may be agreed upon between the District and the purchasers of such bonds. All such bonds shall be authorized by resolution or resolutions of the Board of directors, and shall bear such date or dates, mature at such time or times, bear interest, payable annually, semiannually, or otherwise, be in such denominations, be in such form, either coupon or registered, carry such registration, privileges as to principal only or as to both principal and interest, and as



to exchange of coupon bonds for registered bonds, or vice versa, and exchange of bonds of one denomination for bonds of other denominations, be executed in such manner and be payable at such place or places within or without the State of Texas, as such resolution or resolutions may provide. Any resolution or resolutions authorizing any bonds may contain provisions, which shall be part of the contract between the District and the holders thereof from time to time:

(a) reserving the right to redeem such bonds or requiring the redemption of such bonds, at such time or times, in such amounts and at such prices, not exceeding 105 percent of the principal amount thereof, plus accrued interest, as may be provided;

(b) providing for the setting aside of sinking funds or reserve funds and the regulation and disposition thereof;

(c) pledging to secure the payment of the principal of an interest on such bonds and of the sinking fund or reserve fund payments agreed to be made in respect of such bonds all or any part of the gross or new revenues thereafter received by the District to respect of the property, real, personal, or mixes, to be acquired and/or constructed with such bonds or the proceeds thereof, or all or any part of the gross or net revenues thereafter received by the District from whatever source derived;

(d) prescribing the purposes to which such bonds or any bonds thereafter to be issued, or the proceeds thereof, may be applied;

(e) agreeing to fix and collect rates and charges sufficient to produce revenues adequate to pay (1) all expenses necessary to the operation and maintenance and replacements and additions to the properties and facilities of the District; (2) the principal of, and the interest and premium, if any, on bonds issued under this Act as and when the same became due and payable; (3) all sinking fund and/or reserve fund payments agreed to be made in respect of any such bonds, out of such revenues as and when the same became due and payable; and to fulfill the terms of any agreements made with the holders of such bonds and/or with any person on their behalf and to discharge all other lawful obligations of the district as and when the same become due;

(f) prescribing limitations upon the issuance of additional bonds and subordinate lien bonds and upon the agreements which may be made with the purchasers and successive holders thereof;

(g) with regard to the construction, extension, improvement, reconstruction, operation, maintenance, and repair of the properties of the District and carrying of insurance upon all or any part of said properties covering loss or damage or loss of use and occupancy resulting from specified risks;

(h) fixing the procedure, if any, by which, if the District shall so desire, the terms of any contract with the holders of such bonds may be amended or abrogated, the amount of bonds the holders of which must consent thereto, and the manner in which such consent may be given;

(i) for the execution and delivery by the District to a bank or trust company authorized by law to accept trusts, or to the United State of American or any officer or agency thereof, of indentures and agreements for the benefit of the holders of such bonds and such other provisions as may be customary in such indentures or agreements; and

(j) such other provisions, not inconsistent with the provisions of this Act, as the Board may approve.

The Board may declare an emergency in the matter of funds not being available to pay principal of and interest on any bonds of the District or to meet any other needs of the District. Bond anticipation notes may bear interest at any rate or rates not to exceed 10 percent and shall mature within one (1) year of their date. The bond anticipation notes so issued will be taken up with the proceeds of bonds, or the bonds may be issued and delivered in exchange for and in substitution of such notes.

Before any bonds shall be sold or exchanged or substituted by the District, a certified copy of the proceedings of the issuance thereof, including the form of such bonds, together with any other information which the Attorney General of the State of Texas may require, shall be submitted to the Attorney General, and if he shall find such bonds have been issued in accordance with law, and if he shall approve such bonds, he shall execute a certificate to that effect which shall be filed in the office of the Comptroller of the State of Texas and be recorded in a record kept for that purpose. No bonds shall be issued until the same shall have been registered by the Comptroller, who shall so register the same if the Attorney General shall have filed with the Comptroller his certificate approving the bonds and the proceedings for the issuance thereof as hereinabove provided.

All bonds approved by the Attorney General as aforesaid, and registered by the comptroller as aforesaid, and issued in accordance with the proceedings so approved, shall be valid and binding obligations of the district and shall be incontestable for any cause from and after the time of such registration.

If any bonds recite that they are secured by a pledge of the proceeds of a contract, lease, sale, or other agreement (herein called "contract"), a copy of such contract and the proceedings of the contracting parties will also be submitted to the Attorney General. If such bonds have been authorized and such contracts made in compliance with law, the Attorney General shall approve the bonds and contracts, and the bonds shall then be registered by the Comptroller of Public Accounts. When so approved, such bonds and the contracts shall be valid and binding and shall be incontestable for any cause from and after the time of such registration.



The District is authorized to make and issue bonds (hereto called "refunding bonds") for the purpose of refunding or refinancing any outstanding bonds or notes authorized and issued by the District pursuant to this Act or other law (herein called "bonds") and the interest and premium, if any, thereof to maturity or on any earlier redemption date specified in the resolution authorizing the issuance of the refunding bonds. Such refunding bonds may be issued to refund more than one series of outstanding bonds, may combine the pledges of the outstanding bonds for the security of the refunding bonds, or may be secured by other or additional revenues. All provisions of this Act with reference to the issuance of bonds, the terms and provisions thereof, their approval by the Attorney General, and the remedies of the bondholders shall be applicable to refunding bonds. Refunding bonds shall be registered by the Comptroller upon surrender and cancellation of the bonds to be refunded, but in lieu thereof, the cancellation of the bonds to be refunded, but in lieu thereof, the resolution authorizing the issuance of refunding bonds may provide that they shall be sold and the proceeds thereof deposited in the places at which the original bonds are payable, in which case the refunding bonds may be issued in an amount sufficient to pay the interest and premium, if any, on the original bonds to their maturity date or specified earlier redemption date, and the comptroller will register them without concurrent surrender and cancellation of the original bonds. The District may also refund any outstanding bonds in the manner provided by any applicable General Law.

All bonds issued by the District pursuant to the provisions of this Act shall constitute investment securities within the meaning of the Uniform Commercial Code.

This Act, without reference to other statutes of the State of Texas, shall constitute full authority for the authorization and issuance of bonds hereunder, and no other Act or law with regard to the authorization or issuance of obligations or the deposit of the proceeds thereof, or in any impeding or restricting the carrying out of the acts herein authorized to be done shall be construed as applying to any proceedings taken hereunder or acts done pursuant hereto.

Sec. 8. When any of such revenues are pledged to the payment of any bonds issued by said District, it shall be the right and duty of the District's Board of Directors to cause to be fixed, maintained and enforced charges, fees or tolls for services rendered by properties and facilities, the revenues of which have been pledged, at rates and amounts at least sufficient to comply with and carry out the covenants and provisions contained in the order or orders authorizing the issuance of said bonds. The District shall have the right to impose penalties for failure to pay, when due, such charges, fees or tolls.

Sec. 9. Upon the adoption of this Act, said District shall be a fully created and established conservation and reclamation district, but having the limitations on its powers, as hereinbefore set out in this Act.

Sec. 10. As soon as practicable after the qualification of the first Board of Directors of said District, and from time to time thereafter the Board of Directors shall by resolution designate one or more banks to serve as the District's depository, and all funds of said District shall be secured in the manner provided for the security of county funds.

Sec. 11. The Legislature hereby exercises the authority conferred upon it by Section 54 of Article XVI , Constitution of Texas, and declares that the District created by this Act is essential to the accomplishment of the purposes of said Constitutional provision; finds that all of the land and other property included in the area and boundaries of the District are, and will be benefited by the improvements that the District will purchase, construct or otherwise acquire; and that the District is created to serve a public use and benefit; and declares the District to be a governmental agency, a body politic and corporate and a municipal corporation.

Sec. 12. If any word, phrase, clause, sentence, paragraph, section, or other part of this Act or the application thereof to any person or circumstance, shall ever be held by a court of competent jurisdiction to be invalid or unconstitutional, the remainder of the Act and the application of such word, phrase, clause, sentence, paragraph, section, or other part this Act to other persons or circumstances shall not be affected thereby.

Sec. 13. It is determined and found that a proper and legal notice of the intention to introduce this Act, setting forth the general substance of this Act, has been published at least thirty (30) days and not more than ninety (90) days prior to the introduction of this Act in the Legislature of Texas, in a newspaper having general circulation in Galveston County, Texas; that a copy of such notice and a copy of this Act have been delivered to the Governor of Texas who has submitted such notice and Act to the Texas Water Commission, and said Texas Water Commission has filed its recommendation as to such Act with the Governor, Lieutenant Governor and Speaker of the House of Representatives of Texas within thirty (30) days from the date such notice and Act were received by the Texas Water Commission; and that all the requirements and provisions of Article XVI, Section 59(d) of the Constitution of the State of Texas have been fulfilled and accomplished as therein provided.

Sec. 14. The fact that the creation of such District will result in material benefit to the State of Texas and to the land and other property included in said District and will promote effectively the conservation of water of the State of Texas, creates an emergency and an imperative public necessity requiring that the Constitutional Rule that bills be read on three several days in each House be suspended; and said Rule is hereby suspended, and this Act shall take effect and be in force from and after its passage, and it is so enacted.<sup>1</sup>

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<sup>1</sup> H.B. No. 1127 was passed by the House (145-2) on May 20, 1965, and by the Senate (31-0) on May 26, 1965.