



October 17, 2017

TO: Utility Districts and Municipalities

FROM: North Fort Bend Water Authority (the "NFBWA")

RE: Notice of Consideration of Modification of Director Precincts

Pursuant to Chapter 8813 of the Texas Special District Local Laws Code (the "Code"), the NFBWA is governed by a seven-member Board of Directors (the "Board") jointly appointed by the governing bodies of the utility districts and municipalities located within each of the seven single-member director precincts (each individually, a "Director Precinct"). The number of votes for a governing body of a utility district or municipality within each Director Precinct is based upon the water used by each utility district or municipality within the Director Precinct in which it is located. The Director Precincts were initially established by the NFBWA in 2005 based on the then-current population projections and water demands for the land located within the NFBWA's boundaries. Since that time, significant growth has occurred across Fort Bend County, including within the NFBWA's boundaries.

During the summer of 2017, BGE, Inc. ("BGE"), the NFBWA's engineer, performed an update to the population growth and water demand analysis (the "Analysis") for the property located within the NFBWA's boundaries to assist the NFBWA's Board in its long-term capital improvement planning related to surface water conversion. The Analysis highlighted an unequal distribution of water usage by utility districts and municipalities within the Director Precincts. At a meeting held on October 4, 2017, the Board determined that it is an appropriate time to consider adjusting the current Director Precincts to represent a more balanced distribution of water usage by utility districts and municipalities within each Director Precinct. Prior to adopting the final Analysis and considering whether to adopt modified Director Precincts, the NFBWA's Board is seeking input from the governing bodies of the utility districts and municipalities located within its boundaries.

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Houston, TX 77027 • [www.nfbwa.com](http://www.nfbwa.com) • 713-860-6400 • 713-860-6401 Fax

The draft Analysis, including the proposed modifications to the Director Precincts, has been posted to the NFBWA's website ([www.nfbwa.com](http://www.nfbwa.com)). The Board will consider written and oral comments related to the draft Analysis or possible modification to the NFBWA's current Director Precincts based on the following schedule:

- **October 17, 2017**: Posting of the draft Analysis, including the proposed modifications to the Director Precincts, to the NFBWA's website ([www.nfbwa.com](http://www.nfbwa.com)) for public review and comment. **Please submit all written comments or questions to [nfbwa@abhr.com](mailto:nfbwa@abhr.com).**
- **October 25, 2017 (Regular Board Meeting)**: First public hearing to receive oral comments, as well as to discuss any written comments received prior to the meeting date.
- **November 15, 2017**: Deadline for submission of written comments.
- **November 16, 2017 (Regular Board Meeting)**: Second public hearing to receive additional oral comments, as well as to discuss any additional written comments received through the conclusion of the comment period.
- **December 6, 2017 (Special Board Meeting)**: Board meeting to consider adoption of the final Analysis and resolution regarding redrawing the Director Precincts.

Please note that due to damage sustained from Hurricane Harvey, the NFBWA is currently unable to hold Board meetings in its standard meeting location. Therefore, all of the meetings indicated above will be held at BGE's offices located at 10777 Westheimer, Houston, Texas 77042. The NFBWA's Board looks forward to your valuable feedback as it moves forward with finalizing the Analysis and considering modifying the current Director Precincts.



# Technical Memorandum

To: Board of Directors  
From: Shayna Johnson, PE  
Date: October 4, 2017  
Subject: Population Growth and Water Demand  
Update - Proposed Revised Precinct  
Boundaries

Insert engineer's seal

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## Section 1 Demand Study

### 1.1 Background

The North Fort Bend Water Authority (Authority) projects the water demand of every Groundwater Reduction Plan (GRP Participant) within their boundaries. The GRP Participants consist of Municipal Utility Districts (MUDs), Cities, Contract Participants, and private well owners. See Attachment 1 for a list of the current Contract Participants, Cities, and MUDs located within the Authority's boundary.

Previous demand studies completed for the Authority were calculated using the 2010 Census population data and an assumed per capita water usage based on anticipated development. This method enabled the Authority to accurately plan for future infrastructure and surface water reservation needs with the best available data at that point in time. However, after five years of receiving monthly surface water data, the Authority has more accurate data to utilize for water demand projections allowing the Authority to forecast more precise future water usage needs.

### 1.2 Methodology

For each existing GRP Participant, the Authority used one of four projection methods to determine the GRP Participant's individual water demand from 2018 to 2070. Each GRP Participant was closely studied and many factors were taken in to account before choosing the appropriate projection method for that GRP Participant.

1. **Historical Demand:** The average historical water usage information from the Authority's billing system, Pumpage Reporting Online System (PROs), was used for GRP Participants who have been reporting their water usage data to the Authority for at least two years and are 90 to 100% built out.
2. **Questionnaire Results:** The Authority sent out a questionnaire to the consultants for each GRP Participant to gain more information on current and future water demand projections, proposed developments, and any other information that could affect the Authority's planning efforts.

This method was used for MUDs that are anywhere from 1 to 90% developed and provided a development schedule along with estimate water demand until build out.

3. **Consultant Meetings:** There are many MUDs within the Authority that are 0% developed and are beginning the transition from Developer-owned raw land to an activated and functioning MUD. The Authority scheduled meetings with the consultants for these MUDs to get the development plan to accurately project what year they will begin experiencing a demand for water and when they project to be built out.
4. **Municipal Information Services (MIS) Data:** MIS presents a report to the Authority every year on the population projections for each MUD and Contract Participant within the Authority’s boundary, as well as the City of Fulshear. This projection method utilizes this population and an estimated gallon per capita per day (GPCD) based on the type of development. For example, a master planned community with homes using automatic irrigation systems has a higher GPCD than a retirement community with no irrigation systems. This method is based on multiple assumptions; therefore, it was only used when it was not appropriate to use methods 1 through 3.

Additionally, the Authority has a significant amount of area that has no future development plans but must be considered in future water demand projections. Several meetings were scheduled with developer consultants and land planners to gain insight as to the likelihood and potential timing of development in these areas. This portion of the water demand study has the most unpredictability and will be reevaluated each year to ensure the projections account for the constant changes in these areas.

### 1.3 Results

Table 1 includes a summary of the water demand projections using the methodology detailed above. Attachment 2 includes a detailed summary of the demand per GRP Participant.

<b>Demand Projections</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>MUD and Non-MUD<sup>1</sup></b>	42.01	44.32	46.81	55.71	63.16	79.78	80.33	80.48	80.48
<b>Contract Participant</b>	0.64	1.08	1.84	5.68	9.47	17.08	17.97	18.12	18.28
<b>Private Well Owner</b>	2.45	2.48	2.5	3.20	3.36	3.71	4.10	4.53	5.01
<b>Total</b>	45.11	47.87	51.15	64.59	75.99	100.57	102.40	103.13	103.76

<sup>1</sup> Includes the City of Fulshear

*Table 1. Water Demand Projections*

## Section 2 Authority Precincts

### 2.1 Existing Precincts

These updated demand projections were presented to the Board at a public meeting on August 2, 2017. Following this discussion at the Board meeting, the updated demands were applied to the existing seven precincts established in 2005.

Table 2 depicts the demand split between precincts as the boundaries currently stand. Attachment 2 includes a map of the current location and area each precinct covers. Please note that Contract Participants and private well owners are not included in these calculations since they do not participate in the appointment process, because voting rights are only given to the governing bodies of MUDs and municipalities as further detailed in Section 8813.056 of the Authority's legislation.

<b>Precinct</b>	<b>2018 Demand Projection (Gallons)</b>	<b>Percent of Total Demand</b>
<b>1</b>	1,277,400,000	9%
<b>2</b>	1,343,200,000	9%
<b>3</b>	3,011,250,000	20%
<b>4</b>	1,123,283,850	7%
<b>5</b>	710,213,350	5%
<b>6</b>	793,721,700	5%
<b>7</b>	6,756,150,000	45%
<b>Total</b>	15,037,218,900	100%

*Table 2. Existing Precinct Demand*

When the precincts were initially established, the goal was to make each precinct share an even portion of the overall demand, because votes are calculated based on water usage. Over the last several years the Authority has experienced a large population increase on the west side of its boundary which has created an uneven demand split between precincts. For this reason, BGE recommends to reprecinct each MUD to create a more equitable water demand allocation.

### 2.2 Proposed Revised Precinct Boundaries

The following priorities were given when establishing the new precinct boundaries:

- Each precinct will comprise of +/- 14% of the total demand (i.e., an even portion of the demand);
- Regional systems will be in the same precinct, when possible; and

- Precincts will consist of MUDs and cities that are geographically similar.

The proposed revised precinct boundaries, shown in Attachment 3, create a more equitable distribution between the seven precincts. Table 3 includes the demand split between the proposed revised precincts.

<b>Precinct</b>	<b>2018 Demand Projection (Gallons)</b>	<b>Percent of Total Demand</b>
<b>1</b>	2,325,050,000	15%
<b>2</b>	1,956,400,000	13%
<b>3</b>	2,237,450,000	15%
<b>4</b>	2,306,800,000	15%
<b>5</b>	1,967,966,850	13%
<b>6</b>	1,940,402,050	13%
<b>7</b>	2,303,150,000	15%
<b>Total</b>	15,037,218,900	100%

*Table 3. Proposed Revised Precinct Demand*

### Section 3 Conclusion

The Authority underwent a large-scale water demand update that demonstrates growth within the Authority since its inception in 2005 has led to an imbalance in water demand between precincts. It is BGE’s recommendation to revise the existing precinct boundaries per Attachment 2. The recommended approach creates a more even allocation of water demand between precincts in order to reflect current water usage and population information.

## Attachment 1. GRP Participants

### MUNICIPAL UTILITY DISTRICTS AND CITY

BIG OAKS MUD  
BELFORT PUD  
CINCO MUD #01  
CINCO MUD #02  
CINCO MUD #03  
CINCO MUD #05  
CINCO MUD #06  
CINCO MUD #07  
CINCO MUD #08  
CINCO MUD #09  
CINCO MUD #10  
CINCO MUD #12  
CINCO MUD #14  
CINCO SW MUD #1  
CINCO SW MUD #2  
CINCO SW MUD #3  
CINCO SW MUD #4  
CITY OF FULSHEAR  
CORNERSTONES MUD  
FT BEND CO ID #24  
FT BEND CO MUD #002  
FT BEND CO MUD #030  
FT BEND CO MUD #034  
FT BEND CO MUD #035  
FT BEND CO MUD #037  
FT BEND CO MUD #041  
FT BEND CO MUD #050  
FT BEND CO MUD #053  
FT BEND CO MUD #057  
FT BEND CO MUD #058  
FT BEND CO MUD #118  
FT BEND CO MUD #119  
FT BEND CO MUD #122  
FT BEND CO MUD #123  
FT BEND CO MUD #124  
FT BEND CO MUD #130  
FT BEND CO MUD #132  
FT BEND CO MUD #133  
FT BEND CO MUD #134A  
FT BEND CO MUD #134B  
FT BEND CO MUD #134C  
FT BEND CO MUD #134D  
FT BEND CO MUD #134E

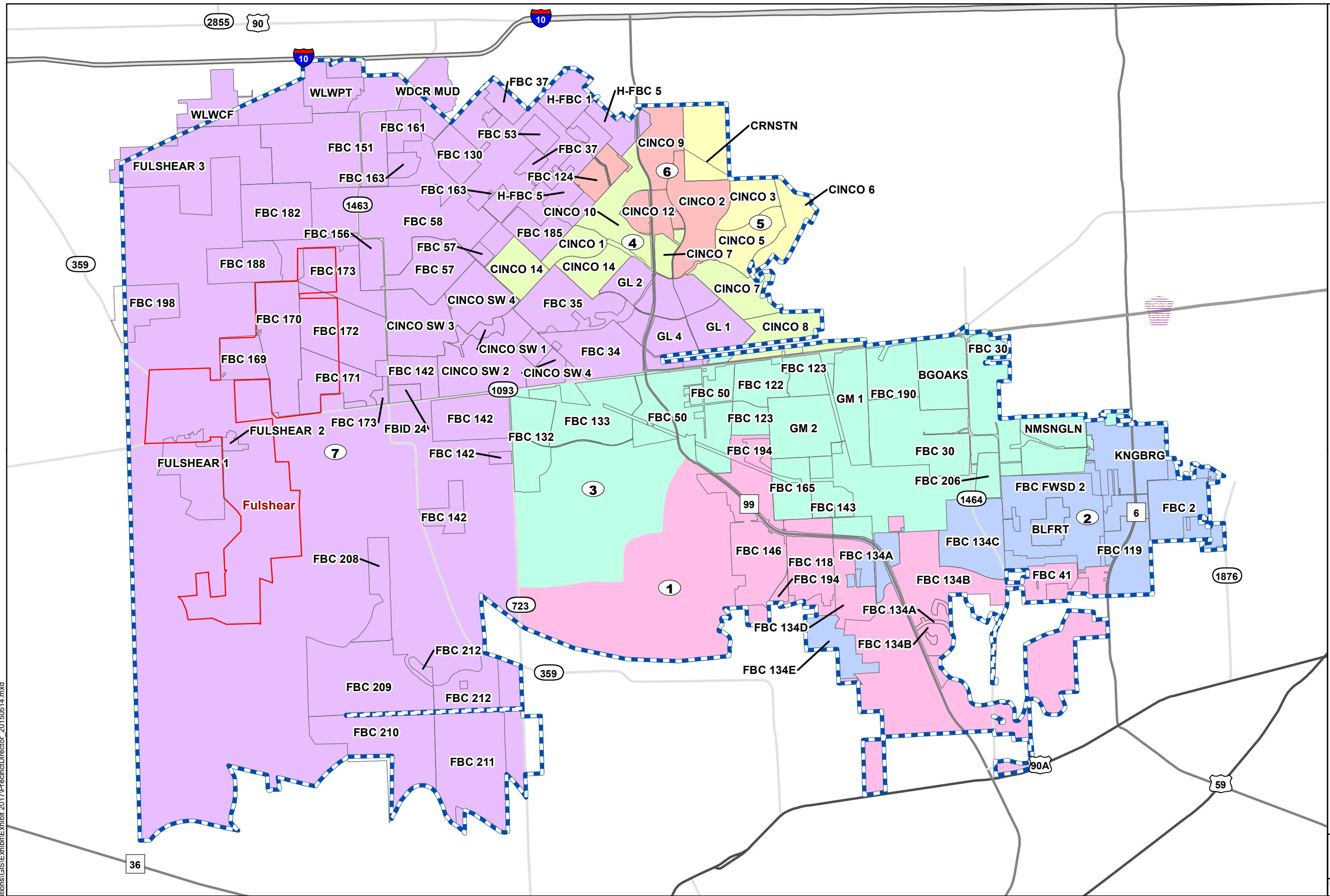
FT BEND CO MUD #142  
FT BEND CO MUD #143  
FT BEND CO MUD #146  
FT BEND CO MUD #151  
FT BEND CO MUD #156  
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FT BEND CO MUD #163  
FT BEND CO MUD #165  
FT BEND CO MUD #169  
FT BEND CO MUD #170  
FT BEND CO MUD #171  
FT BEND CO MUD #172  
FT BEND CO MUD #173  
FT BEND CO MUD #182  
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FT BEND CO MUD #198  
FT BEND CO MUD #206  
FT BEND CO MUD #208  
FT BEND CO MUD #209  
FT BEND CO MUD #210  
FT BEND CO MUD #211  
FT BEND CO MUD #212  
FT BEND FWSD #2  
FULSHEAR MUD #1  
FULSHEAR MUD #2  
FULSHEAR MUD #3  
GRAND LAKES MUD #1  
GRAND LAKES MUD #2  
GRAND LAKES MUD #4  
GRAND MISSION MUD #1  
GRAND MISSION MUD #2  
HARRIS-FT BEND CO MUD #1  
HARRIS-FT BEND CO MUD #5  
KINGSBRIDGE MUD  
NORTH MISSION GLEN MUD  
WILLOW CREEK FARMS MUD  
WILLOW POINT MUD  
WOODCREEK RESERVE MUD

## **Attachment 1. GRP Participants**

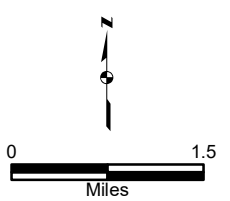
### **CONTRACT PARTICIPANTS**

CHAMPION TECHNOLOGIES, INC.  
ORBIT SYSTEMS, INC.  
CITY OF ARCOLA, TEXAS  
KINGDOM HEIGHTS HOA, INC.  
LHOIST NORTH AMERICA OF TEXAS,  
LTD.  
GEORGE FOUNDATION  
FT BEND CO FWSD #1  
FT BEND CO MUD #131  
FT BEND CO MUD #141  
FT BEND CO MUD #189  
ROYAL VALLEY UTILITIES





- NFBWA Boundary
- City of Fulshear
- Precinct Directors
- 1 - David Spell
- 2 - Robert Darden
- 3 - Bruce Fay
- 4 - Melony Gay
- 5 - Robert Patton
- 6 - Peter C. Houghton
- 7 - Pat Hebert



Disclaimer:  
Every effort has been made to ensure the accuracy of the basemap data. Brown & Gay Engineers, Inc. assumes no liability or damages due to errors or omissions.

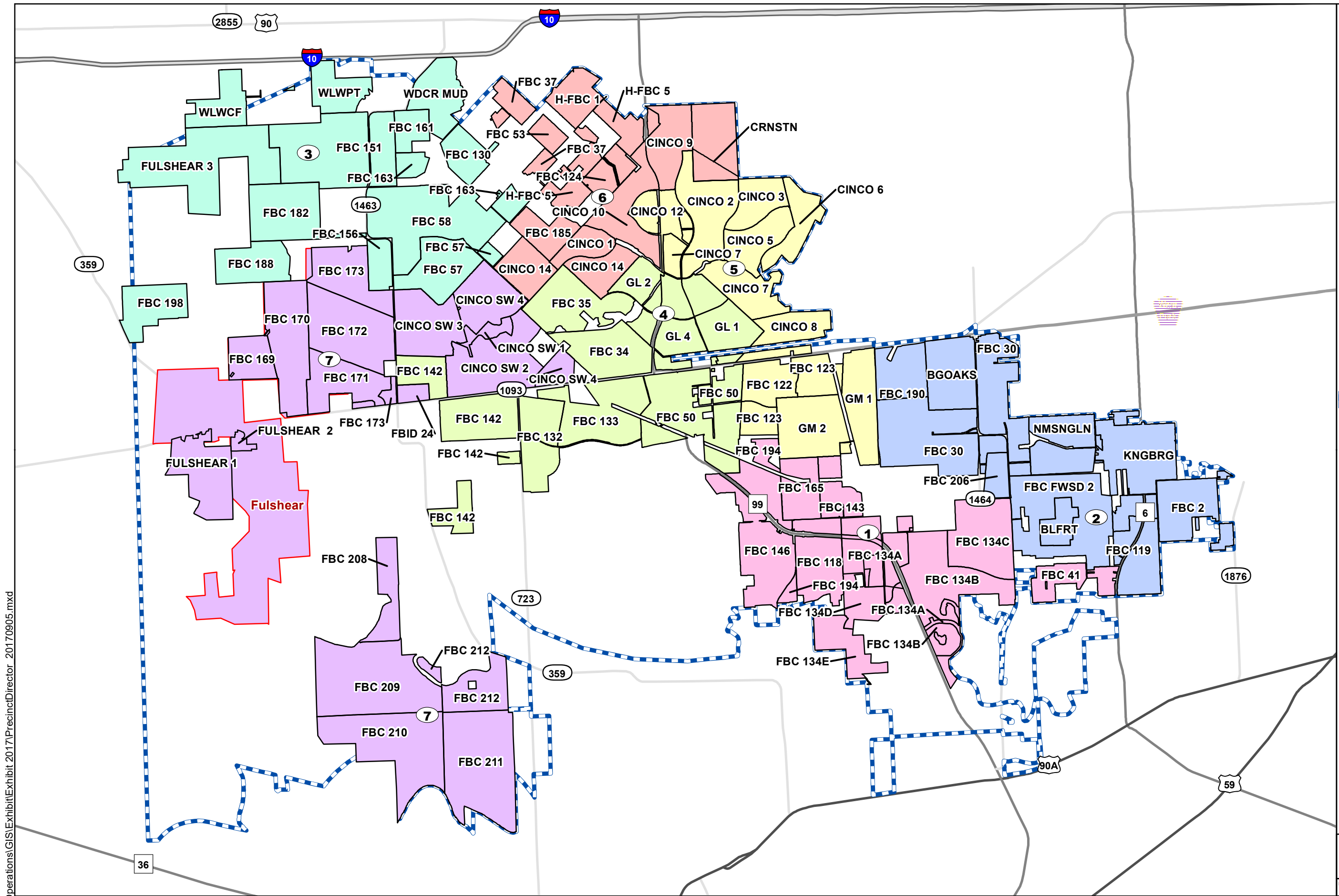
Attachment 2  
Current Precinct  
Boundaries

Date: Sept. 2017 Job No: NFB00

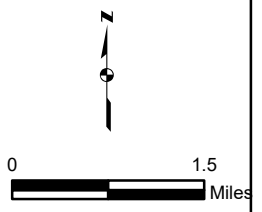
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# Attachment 2 – Current Precinct Boundaries

BGE, Inc.  
Tel: 281-558-8700  
www.bgeinc.com



- NFBWA Boundary
- City of Fulshear
- Precinct Directors**
- 1 - David Spell
- 2 - Robert Darden
- 3 - Bruce Fay
- 4 - Melony Gay
- 5 - Robert Patton
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- 7 - Pat Hebert



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Attachment 3 Proposed Revised Precinct Boundaries	
Date: Sept. 2017	Job No: NFB00

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# Attachment 3 – Proposed Revised Precinct Boundaries

**BGE, Inc.**  
Tel: 281-558-8700  
www.bgeinc.com

Attachment 3.  
Proposed Revised Precinct List

**Precinct 1**

FBC MUD 41  
FBC MUD 118  
FBC MUD 134A  
FBC MUD 134B  
FBC MUD 134C  
FBC MUD 134D  
FBC MUD 134E  
FBC MUD 143  
FBC MUD 146  
FBC MUD 165  
FBC MUD 194

**Precinct 2**

BELFORT PUD  
BIG OAKS MUD  
FBC FWSD 2  
FBC MUD 2  
FBC MUD 30  
FBC MUD 119  
FBC MUD 190  
FBC MUD 206  
KINGSRBRIDGE MUD  
NMG MUD

**Precinct 3**

FBC MUD 57  
FBC MUD 58  
FBC MUD 130  
FBC MUD 151  
FBC MUD 156  
FBC MUD 161  
FBC MUD 163  
FBC MUD 182  
FBC MUD 188  
FBC MUD 198  
FULSHEAR MUD 3  
WILLOW POINT MUD  
WILLOW CREEK FARMS MUD  
WOODCREEK RESERVE MUD

**Precinct 4**

FBC MUD 34  
FBC MUD 35  
FBC MUD 50  
FBC MUD 132  
FBC MUD 133  
FBC MUD 142  
GRAND LAKES MUD 1  
GRAND LAKES MUD 2  
GRAND LAKES MUD 4

**Precinct 5**

CINCO MUD 2  
CINCO MUD 3  
CINCO MUD 5  
CINCO MUD 6  
CINCO MUD 7  
CINCO MUD 8  
CINCO MUD 12  
FBC MUD 122  
FBC MUD 123  
GM MUD 1  
GM MUD 2

**Precinct 6**

CINCO MUD 1  
CINCO MUD 9  
CINCO MUD 10  
CINCO MUD 14  
CORNERSTONES MUD  
FBC MUD 37  
FBC MUD 53  
FBC MUD 124  
FBC MUD 185  
HFBC MUD 1  
HFBC MUD 5

**Precinct 7**

CINCO SOUTHWEST MUD 1  
CINCO SOUTHWEST MUD 2  
CINCO SOUTHWEST MUD 3  
CINCO SOUTHWEST MUD 4  
CITY OF FULSHEAR  
FBC ID 24  
FBC MUD 169  
FBC MUD 170  
FBC MUD 171  
FBC MUD 172  
FBC MUD 173  
FBC MUD 208  
FBC MUD 209  
FBC MUD 210  
FBC MUD 211  
FBC MUD 212  
FULSHEAR MUD 1  
FULSHEAR MUD 2