Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, May 27, 2014 9:58 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 07424

From: Jose.C.Alvarez@Boeing.com [mailto:Jose.C.Alvarez@Boeing.com]
Sent: Friday, May 23, 2014 11:45 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Jose Carlos Alvarez, JR

E-MAIL: Jose.C.Alvarez@Boeing.com

COMPANY:

ADDRESS: 15726 TORRY PINES RD
HOUSTON TX 77062-4512

PHONE: 2814882937

FAX:

COMMENTS: The extremely slow movement of treated waste water through the detention facility flow channels can result in stagnant areas that will cause mosquito infestation and algal blumes causing noxious odors. I live next to the golf course, the resulting ordor and mosguitos will permiate my home and tremendously degrade my quality of life and reduce my immediate property value while leaving me with a heavy tax burden that results from the highly expensive property existing and under development in other parts of the CLCWA.

MW

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Friday, June 20, 2014 7:59 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8744

From: scott.askew@sbcglobal.net [mailto:scott.askew@sbcglobal.net]
Sent: Friday, June 20, 2014 3:36 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Scott Askew

E-MAIL: scott.askew@sbcglobal.net

COMPANY:

ADDRESS: 15147 DIANA LN
HOUSTON TX 77062-2801

PHONE: 2819542561

FAX:

COMMENTS: I attended the public meeting and spoke during the informal question period. The questions I have for the TCEQ are as follows: 1. Please cite specific examples of similar installations of large repositories of almost entirely treated sewage water(~60 acres lakes, ~40 acres wetlands) into existing residential neighborhoods. There will be on the order of 40 million gallons in these bodies of water, and there is currently only a small trickle of water in the channels that exist now. 2. Will the water level of the lakes created by the

MWD

treated sewage water be different than the existing level of water in the channels and how will this affect flow into and out of the area? Presumably the same total volume will flow out of Horse Pen Bayou into Armand Bayou as does now, but the flow before that will be quite a bit larger. Given that the Water Authority is requesting 1M gallons per day (from each new outlet?) what do your water flow models show this amount of water will do to existing channel water levels? This question may be more pertinent to the HCFCD, but it seems relevant to understanding how this change in flow affects aquatic life in and around the existing channels. 3. I asked a question at the meeting with regard to the signage and restrictions for human contact from recreational use (swimming, boating, fishing, etc) of the new lakes that would be created and it seemed the TCEQ reps stated they do not place any limits on the future human recreational use. I was somewhat surprised to hear this so I want to ask that this be answered on the record. Are there any requirements for signage informing people to maintain some distance or minimize their contact with the lakes that proposed with the treated sewage water? Is this water considered safe for swimming and fishing with the intent of consumption? A community garden was proposed during the planning phase for the new recreation area, and there were statements made at that time that the treated sewage water could not be used for gardening purposes. Is there any regulatory entity that considers the appropriate human use of the treated sewage water once the lakes have been formed? 4. Does the TCEQ have a position on the use of aerators (fountains) and the fine mist generated by them coming in contact with humans? Is there any distance requirement for placement of aerators to not produce or minimize mists that humans can be exposed to. 5. Does the TCEQ have an estimate/requirement for what level of flow is required to prevent stagnation of the water and breeding of mosquitoes? 6. If these lakes are created will the Water Authority be required to maintain backup pumping equipment to maintain flow in the event of equipment failure? Presumably a widespread power outage would be caused by a hurricane or other large weather related event so there is likely to be sufficient water independent of the Water Authority, but the lakes should not be allowed to become breeding grounds for disease carrying insects due to other equipment failure. Does the TCEQ have the authority to require sufficient backup equipment to prevent severe mosquito breeding? Thank you for addressing these questions.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 02, 2014 9:06 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: bgballard@comcast.net [mailto:bgballard@comcast.net]
Sent: Thursday, May 29, 2014 6:19 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Billy Ballard

E-MAIL: bgballard@comcast.net

COMPANY:

ADDRESS: 1119 FESTIVAL DR
HOUSTON TX 77062-4403

PHONE: 2812808017

FAX:

COMMENTS: I am a cancer survivor and walk on the old golf course trails daily. I'm extremely concerned about the health effects of treated toilet water not to mention the mosquitoes, germs and smell. I live across the street from the old golf course and do not want this in my neighborhood. This is a completely unacceptable and unnecessary health hazard.

Marisa Weber

From: PUBCOMMENT
Sent: Wednesday, May 15, 2013 8:23 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

PM

MWD 87424

From: PUBCOMMENT-OCC
Sent: Wednesday, May 15, 2013 7:48 AM
To: PUBCOMMENT
Subject: FW: Public comment on Permit Number WQ0010539001

From: bgballard@comcast.net [mailto:bgballard@comcast.net]
Sent: Tuesday, May 14, 2013 9:03 PM
To: donotReply@tceq.state.tx.us
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Billy Ballard

E-MAIL: bgballard@comcast.net

COMPANY:

ADDRESS: 1119 FESTIVAL DR
HOUSTON TX 77062-4403

PHONE: 2812808017

FAX:

MWD

COMMENTS: I request a public meeting application number WQ0010539[illegible].

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 01, 2014 7:43 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Note: Comment is attached to Enforcement item in error. This is a comment on the pending permit.

MWD 8/4/24

From: cindybandemer@yahoo.com [mailto:cindybandemer@yahoo.com]
Sent: Tuesday, September 30, 2014 8:21 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Cynthia Jean Bandemer

E-MAIL: cindybandemer@yahoo.com

COMPANY:

ADDRESS: 15147 DIANA LN
HOUSTON TX 77062-2801

PHONE: 2817875558

FAX:

COMMENTS: I am a resident whose property is directly adjacent to the property in question. I support the permit to proceed with construction. I have no concerns about the use of re-use water for the project and believe the entire project will enhance our community and property vallues. According to publicly available Discharge Monitoring Reports (DMRs) the monthly 30-day geometric mean bacteria counts in the CLCWA reuse water

are less than 10% of the maximum allowed by the permit. The CLCWA reuse water has far less bacteria than the receiving water (Horsepen Bayou) and all other waters of the Armand Bayou watershed according to the April 2014 TCEQ study of the Armand Bayou watershed. I trust the use of treated reuse water meeting TCEQ standards at Exploration Green, like that used for many years at the golf course and other public locations, will not create obnoxious odors nor have public health impacts. Reuse water is accepted widely in Texas and across the nation, so we see real benefits in its use at this site, drainage ditches or Horsepen Bayou close to our home. Opponents of the Exploration Green master plan made it the sole issue of the May 10th CLCWA Board Election. But voters favored candidates running in favor of the Exploration Green master plan by a 3-1 margin over candidates opposed to the plan. For TCEQ to deny the permit without technical, scientific reasons for doing so would overturn the will of the community. I urge you to grant the permit and put the baseless issue of reuse water behind us. Thank you.

13

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: Leigh Baxter

Mailing Address: 2002 Fairwind

Physical Address (if different): _____

City/State: Houston TX **Zip:** 77062

This information is *subject to public disclosure under the Texas Public Information Act*

Email: leighbaxter2@yahoo.com ✓

Phone Number: 281 480 5469

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

☑ **Please add me to the mailing list.** ✓

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MP

Clear Lake City Water Authority TPDES permit no. WQ0010539001

May 29, 2014

Statement of *Opposing* Effluent Water

TCEQ states in their mission statement that they will *protect* public health. Common sense says that putting effluent water in a huge clay based pit to bake in the Houston heat in the middle of a neighborhood, adjacent to backyards cannot guarantee protection from deadly pathogens and disease.

Even with approval of Texas existing regulations, *no* guarantee can be made that our family and neighbors will not get sick. Texas regulations are behind in cleaning water, compared to many other states. I oppose putting effluent water adjacent to my backyard and will not allow CLCWA & Exploration Green to guinea pig on my family's health much like the Brio sight located here in the immediate Clear Lake area and Forest of Friendswood.

Exploration Green / Clear Lake City Water Authority plan recreational parks to be around the effluent water lakes. Biking trails, walking trails, people, animals, and concentrated effluent water together, do not make common sense no matter what the regulations. Processing water is not bullet proof, as errors do happen.....not in my backyard. In conclusion, my children and family will be directly affected, and I strongly oppose having effluent water in the vicinity of my backyard and neighborhood. I urge you to reconsider approving this permit.

Thank you,

Leigh Baxter, Oakbrook Resident of 18 years
2002 Fairwind Rd
Houston Tx 77062

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, October 09, 2014 8:10 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8/7/24

From: rsmb731@gmail.com [mailto:rsmb731@gmail.com]
Sent: Wednesday, October 08, 2014 5:50 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Ray Michael Bernard

E-MAIL: rsmb731@gmail.com

COMPANY:

ADDRESS: 1639 BEACHCOMBER LN
HOUSTON TX 77062-5408

PHONE: 2816872096

FAX:

COMMENTS: We trust the use of treated reuse water meeting TCEQ standards at Exploration Green, like that used for many years at the golf course and other public locations, will not create obnoxious odors nor have public health impacts. Reuse water isaccepted widely in Texas and across the nation, so we see real benefits in its use at this site, drainage ditches or Horsepen Bayou close to our home. I Ray Bernard am in favor reuse water.

MWD

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, October 09, 2014 8:10 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8/7/24

From: rsmbernard@sbcglobal.net [mailto:rsmbernard@sbcglobal.net]
Sent: Wednesday, October 08, 2014 5:37 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MRS Suzanne Marie Bernard

E-MAIL: rsmbernard@sbcglobal.net

COMPANY:

ADDRESS: 1639 BEACHCOMBER LN
HOUSTON TX 77062-5408

PHONE: 2816872096

FAX:

COMMENTS: We trust the use of treated reuse water meeting TCEQ standards at Exploration Green, like that used for many years at the golf course and other public locations, will not create obnoxious odors nor have public health impacts. Reuse water isaccepted widely in Texas and across the nation, so we see real benefits in its use at this site, drainage ditches or Horsepen Bayou close to our home. I Suzanne Bernard want my name taken off the petition that would prevent the reuse water. Thank You.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 8:11 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: heather@joebibby.com [mailto:heather@joebibby.com]
Sent: Wednesday, May 28, 2014 4:31 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

MWD 87424

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Heather Bibby

E-MAIL: heather@joebibby.com

COMPANY:

ADDRESS: 1614 RESEDA DR
HOUSTON TX 77062-5403

PHONE: 7136704966

FAX:

COMMENTS: I support the approval of this permit. Allowing reuse water to flow through Exploration Green is an excellent use of this treated water and will help in creating a new gem in the Clear Lake area of Houston. Reuse water has a long history of being used on this property and using it to allow a continuous flow of water through this new area will prevent these new drainage and park like atmospheres from drying up into a muddy

MWD

stagnant mess when not needed . rainwater overflow. We live directly c .e Exploration Green space and will be one of the home most impacted by this permit. Please approve this permit.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 8:11 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: joe@joebibby.com [mailto:joe@joebibby.com]
Sent: Wednesday, May 28, 2014 4:29 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Joseph Bibby

E-MAIL: joe@joebibby.com

COMPANY:

ADDRESS: 1614 RESEDA DR
HOUSTON TX 77062-5403

PHONE: 7136704977

FAX:

COMMENTS: I support the approval of this permit. Allowing reuse water to flow through Exploration Green is an excellent use of this treated water and will help in creating a new gem in the Clear Lake area of Houston. Reuse water has a long history of being used on this property and using it to allow a continuous flow of water through this new area will prevent these new drainage and park like atmospheres from drying up into a muddy stagnant mess when not needed for rainwater overflow.

MW

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, May 28, 2014 2:55 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: yablanchard@gmail.com [mailto:yablanchard@gmail.com]
Sent: Wednesday, May 28, 2014 2:48 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MS Yvette Blanchard

E-MAIL: yablanchard@gmail.com

COMPANY:

ADDRESS: 15815 DIANA LN
HOUSTON TX 77062-4433

PHONE: 2812186221

FAX:

COMMENTS: I am in full support of the Exploration Green project in my Clear Lake community It has been well planned, explained and led by credible professionals from within my community.

Marisa Weber

From:	PUBCOMMENT-OCC
Sent:	Wednesday, October 01, 2014 7:44 AM
To:	PUBCOMMENT-OCC2
Subject:	FW: Public comment on Permit Number WQ0010539001

Note: Comment is attached to Enforcement item in error. This is a comment on the pending permit.

MWD 87424

From: kaybowl@comcast.net [mailto:kaybowl@comcast.net]
Sent: Tuesday, September 30, 2014 6:25 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Karla Bowling

E-MAIL: kaybowl@comcast.net

COMPANY:

ADDRESS: 15018 SAINT CLOUD DR
HOUSTON TX 77062-2826

PHONE: 2814886955

FAX:

COMMENTS: I am very much in favor of this green space in my neighborhood.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, April 06, 2015 8:30 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: johnbbranch@yahoo.com [mailto:johnbbranch@yahoo.com]
Sent: Thursday, April 02, 2015 10:52 PM
To: DoNot Reply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: John Branch

E-MAIL: johnbbranch@yahoo.com

COMPANY:

ADDRESS: 15846 SCENIC VIEW DR
HOUSTON TX 77062-4777

PHONE: 2814806503

FAX:

COMMENTS: Respectfully request that the subject pending permit NOT be delayed any longer and that any request for a contested case hearing NOT be granted. This request for an immediate approval is based on the following: 1. After purchasing the property, the CLCWA spent two years engaging the community through a series of five town hall meeting gathering input on what the community would like to see incorporated into the detention pond design. A vast majority wanted the "shallow Lake" concept. 2. A CLCWA board of director

election was conducted last Spring. One slate wanted the CLCWA to proceed as planned and the other slate wanted only a park. The candidates who wanted to proceed as planned won by a majority of three to one (75% of community would like for the permit to be granted and for the CLCWA to proceed as planned. 3. Nearly all new subdivisions in the area incorporate using re-use water to keep a minimum level in their detention ponds - they are built before homes are built. Very common practice in Harris and Galveston counties. 4. Under the current permit, the Bay Oaks Country Club uses re-use water for irrigation and water hazards (the newest and most expensive housing area in Clear Lake)just like the former Clear Lake Golf Club used on the property before it was purchased by the CLCWA. 5. A partnership was made with the Texas Coastal Watershed Program of Texas A&M System to incorporate a wetlands area and a grant was received and a grasses nursery was built. Additional funds will be received to purchase the wetland grasses. All of this requires the use of re-use water. Currently, storm water runoff goes directly to the bayou and gulf without and cleaning. Re-use water will allow the storm water to be cleaned naturally and filtered for the first time. 6. A partnership has also been formed between CLCWA and Trees for Houston. TFH has agreed donate 5,000 tress for the entire 178 acres. Approximately 500 trees are already growing in a tree nursery built by the CLCWA. This forestation plan requires re-use water for irrigation of the trees and native grasses/wildflowers. 7. A conservation easement has been signed between CLCWA (landowner) and the Galveston Bay Foundation. The GBF desires the re-use water to develop islands, a safe sanctuary for migratory birds. It would be too expensive to use fresh water plus that would be a waste of potable water. 8. When the City of Houston instituted their "drainage fee" a few years ago, they agreed to exempt that part of city which lay within the CLCWA as long as the CLCWA spent annually what would have been paid in fees (currently $2.4 million). If the permit is not granted soon, the exemption might be in jeopardy which would be costly to our residents and businesses. Re-use water is critical to the master plan developed by the residents and confirmed by the voters in the last director election. Not only do the majority of the residents and business owners favor the plan, but the master plan has already been recognized and given an award by the City of Houston, Keep Houston Beautiful Committee Award, Grand Award winner from the Houston Galveston Area Council in the Master Plan category, Special recognition from the Texas Landscape Architects Assn. The master plan has also been nominated by Trees for Houston for the 2015 Arbor Award. Respectfully request that the permit be issued quickly without additional delay.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 01, 2014 7:43 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Note: Comment is attached to Enforcement item in error. This is a comment on the pending permit.

MWD 8/4/24

From: jbranchhome@yahoo.com [mailto:jbranchhome@yahoo.com]
Sent: Tuesday, September 30, 2014 8:46 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: John Branch

E-MAIL: jbranchhome@yahoo.com

COMPANY:

ADDRESS: 15846 SCENIC VIEW DR
HOUSTON TX 77062-4777

PHONE: 2814806503

FAX:

COMMENTS: I urge approval of this permit. I live in the Bay Forest subdivision about one block from the drainage ditch and Horsepen Bayou where the detention ponds will discharge. Having reviewed all the data available, I am confident that not only is this permit safe, it is also a tremendous new amenity to the area. Having attended all the town hall meetings and reading all the public input from the CLCWA process to develop the master plan for Exploration Green, I personally know that this plan has the overwhelming support

of the community. This permit is an asset and I hope that the TCEQ does not allow a few verbal dissidents stop what the community supports.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, May 28, 2014 2:56 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8TH 4

From: dbremer61@gmail.com [mailto:dbremer61@gmail.com]
Sent: Wednesday, May 28, 2014 2:32 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR David R Bremer

E-MAIL: dbremer61@gmail.com

COMPANY:

ADDRESS: 1915 SEAKALE LN
HOUSTON TX 77062-6115

PHONE: 8328182332

FAX:

COMMENTS: My family and I support Exploration Green. We have lived on the old golf course for 17 years. We welcome and look forward to the improvements that have been proposed. We ask that you approve this permit. Thank you for your time and consideration of this permit. D.R. Bremer

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, October 07, 2014 9:56 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Incorrectly assigned to the Enf Order.

MWD 8/4/24

From: PUBCOMMENT-OCC
Sent: Tuesday, October 07, 2014 9:02 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: abrown081257@gmail.com [mailto:abrown081257@gmail.com]
Sent: Tuesday, October 07, 2014 7:44 AM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Allen Brown

E-MAIL: abrown081257@gmail.com

COMPANY:

ADDRESS: 1703 RAMADA DR
HOUSTON TX 77062-6013

PHONE: 2815137100

FAX:

MWD

COMMENTS: I am a Clear La.. .esident and have lived for 20 years at t .ome which is located directly adjacent to the former Clear Lake Golf course. I am writing to express my wholehearted support for the approval of the permit requested by the Clear Lake City Water Authority. I have absolutely no concerns related to the use of re-use water in the proposed retention/detention ponds and do not feel the project will negatively impact me in any way. In fact, I believe when completed the project will provide a method to actually improve the quality of water discharged into the bayou and ultimately into Galveston bay. In addition, when completed the green space created with native trees and shrubs will also provide much needed habitat for resident and migrating birds and butterflies. I believe in this project so strongly that I have been a volunteer working on this project for over a year. I personally know the dedication and expertise the CLCWA and its partners in this project bring to the table and truly appreciate everything the water authority has done to gather community input throughout the development of the master plan for Exploration Green. I realize there are opponents to the project; however they are by far in the minority. This was clearly demonstrated by the results of the recent board election during which the sole issue was the Exploration Green project. The voters overwhelmingly expressed their support for the project by electing the two board members who supported the project. I sincerely thank you for allowing me to express my opinion and am asking that the TCEQ approve the requested permit without further delay.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, October 07, 2014 9:02 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8/7/14

From: abrown081257@gmail.com [mailto:abrown081257@gmail.com]
Sent: Tuesday, October 07, 2014 7:44 AM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Allen Brown

E-MAIL: abrown081257@gmail.com

COMPANY:

ADDRESS: 1703 RAMADA DR
HOUSTON TX 77062-6013

PHONE: 2815137100

FAX:

COMMENTS: I am a Clear Lake resident and have lived for 20 years at my home which is located directly adjacent to the former Clear Lake Golf course. I am writing to express my wholehearted support for the approval of the permit requested by the Clear Lake City Water Authority. I have absolutely no concerns related to the use of re-use water in the proposed retention/detention ponds and do not feel the project will negatively impact me in any way. In fact, I believe when completed the project will provide a method to actually improve

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Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, October 07, 2014 9:56 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Incorrectly assigned to the Enf Order.

MWD 8/7/24

From: PUBCOMMENT-OCC
Sent: Tuesday, October 07, 2014 9:02 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: abrown081257@gmail.com [mailto:abrown081257@gmail.com]
Sent: Monday, October 06, 2014 11:02 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Allen Brown

E-MAIL: abrown081257@gmail.com

COMPANY:

ADDRESS: 1703 RAMADA DR
HOUSTON TX 77062-6013

PHONE: 2815137100

FAX:

COMMENTS: I am a Clear Lak_ sident and have lived for 20 years at n_ ome which is located directly adjacent to the former Clear Lake Golf course. I am writing to express my wholehearted support for the approval of the permit requested by the Clear Lake City Water Authority. I have absolutely no concerns related to the use of re-use water in the proposed retention/detention ponds and do not feel the project will negatively impact me in any way. In fact, I believe when completed the project will provide a method to actually improve the quality of water discharged into the bayou and ultimately into Galveston bay. In addition, when completed the green space created with native trees and shrubs will also provide much needed habitat for resident and migrating birds and butterflies. I believe in this project so strongly that I have been a volunteer working on this project for over a year. I personally know the dedication and expertise the CLCWA and its partners in this project bring to the table and truly appreciate everything the water authority has done to gather community input throughout the development of the master plan for Exploration Green. I realize there are opponents to the project; however they are by far in the minority. This was clearly demonstrated by the results of the recent board election during which the sole issue was the Exploration Green project. The voters overwhelmingly expressed their support for the project by electing the two board members who supported the project. I sincerely thank you for allowing me to express my opinion and am asking that the TCEQ approve the requested permit without further delay.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, October 07, 2014 9:02 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8/7/24

From: abrown081257@gmail.com [mailto:abrown081257@gmail.com]
Sent: Monday, October 06, 2014 11:02 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Allen Brown

E-MAIL: abrown081257@gmail.com

COMPANY:

ADDRESS: 1703 RAMADA DR
HOUSTON TX 77062-6013

PHONE: 2815137100

FAX:

COMMENTS: I am a Clear Lake resident and have lived for 20 years at my home which is located directly adjacent to the former Clear Lake Golf course. I am writing to express my wholehearted support for the approval of the permit requested by the Clear Lake City Water Authority. I have absolutely no concerns related to the use of re-use water in the proposed retention/detention ponds and do not feel the project will negatively impact me in any way. In fact, I believe when completed the project will provide a method to actually improve

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16

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: ALLEN BROWN

Mailing Address: 1703 RAMADA, HOUSTON TX 77062

Physical Address (if different): _____

City/State: HOUSTON, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: abrown081257@gmail.com ✓

Phone Number: 281-513-7100

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☑ **Please add me to the mailing list.** ✓

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting) ✓

Please give this form to the person at the information table. Thank you.

Permit WQ0010539001

I would like to start by stating that I have a totally vested interest in this amendment. The reason is because for approximately 20 years, I have owned and resided in a home which borders section 2 of the former Clear Lake City golf course now known as Exploration Green.

With that in mind, I would like to express my wholehearted support for the approval of the amendment to allow reuse water in the retention/detention ponds on that property.

I support this amendment because the reuse water is an integral part of almost all aspects of the master plan for Exploration Green. The master plan will turn a predominately featureless, defunct golf course into a state of the art flood control facility that will utilize reuse water in several important and beneficial ways.

First, it will be used to support wetlands, which will not only provide habitat for wading birds, but will also help filter polluted runoff water before it enters the water shed that ultimately feeds into Galveston Bay.

Second, it will be used to provide irrigation for areas that will be forested with a large variety of native trees, plants and grasses, which in turn will support resident and migrating birds and butterflies.

Third, the water features of the master plan will provide an ascetically pleasing park, containing hike and bike trails for use by the public.

I feel that together, these features, which are all dependent on reuse water, will create a unique urban habitat that can be shared by both nature and humans. In addition, I feel it will revitalize my neighborhood, one of the oldest in Clear Lake, and ultimately increase my property value.

I am aware there are a few people who believe that utilizing reuse water will expose them to health issues, however, I do not share their belief. I know reuse water is used successfully and without incident in many other areas in Texas and throughout the country, including irrigation for the former golf course before it was closed. As a result, I do not have any concerns regarding its use in this situation.

I thank you for your time and ask that you approve the amendment to the permit.

Allen Brown

1703 Ramada Dr.

Houston, TX 77062

281-513-7100

Abrown081257@gmail.com

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

(5)

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014

AT PUBLIC MEETING

PLEASE PRINT

Name: HERSCHEL BUTLER

Mailing Address: 15135 DIANA LANE

Physical Address (if different): _____

City/State: HOUSTON, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: BUTZOR/HERSCHEL@YAHOO ✓

Phone Number: 281-854-7602

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

May 29, 2014

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

To: Texas Commission for Environmental Quality (TCEQ)

Re: Permit No. WQ0010539001, WQ0015143001

My name is Herschel Butler and I live directly on the old Clear Lake Golf Course at 15135 Diana Lane, Houston, TX 77062, phone number 281-984-7602.

I have deep concern and questions about the safety of the daily dumping of over a million gallons of treated sewer water into my back yard by the Clear Lake City Water Authority (CLCWA). The local people supported the CLCWA when they originally sought to procure the old golf course because the CLCWA had stated that they simply wanted to use it to collect runoff rainwater thereby preventing flooding. Once they had ownership of the land, the CLCWA did a 180 degree turnabout, violated their promises, and violated the people's trust.

Due to my age and weakened immune system as well as concern for the health of my 7 year old son, and in consideration of the fact that waste from hospitals, doctors offices, and chemical plants are run through the CLCWA treatment plant, I now ask you:

- Can you guarantee that harmful pathogenic bacteria will not be present to the extent it would affect the health of myself, my 7 year old son, and all others who might also have weakened immune systems?
- Can you guarantee that no cancer causing carcinogens will be in the treated sewer water?
- Since CLCWA is already planning to hand over ownership and responsibility of the property to a third entity, would any TCEQ permit apply to any other entity?
- How do you prevent the natural inclination or tendency of neighborhood children to run and play in the water from happening here? Could the children drown or could they become sickened by the sewer water?
- Since CLCWA does not have adequate financial ability to start with, how can we be assured that they will adequately maintain the development?
- Since the development will undoubtedly result in increased mosquito populations that could bring St. Louis Encephalitis, Dengue Fever, West Nile Virus and many other diseases, how will this problem be addressed on an ongoing permanent basis (especially considering that the CLCWA does not have the funds for this and because the CLCWA is passing responsibility to a third entity that quite possibly does not have sufficient funds or will to take care of this problem).
- The mosquito problem will undoubtedly become so bad that nobody will be able to enjoy the outdoors anymore.
- What is the purpose of dumping all of this treated sewer into my backyard anyway when the CLCWA has always dumped it directly into Horse Pen Bayou. What is really going on here?

- Why aren't records showing the amount of pathogenic bacteria in each gallon of the CLCWA treated Sewer Water daily output available to interested parties?
- Sure, treated water has been used for watering grass where it dissipates or as in San Antonio where it is a tourist attraction in the Riverwalk, but in this case the CLCWA is wanting to dump a daily amount of over 1 million gallons of water into the backyards of people wanting to and expecting to live normal lives without the interference of government people with some kind of ulterior motives.
- Finally, I ask you, would you want treated Sewer Water to be dumped into your back yard? Seriously?

I only ask that you take the time to make a careful and informed decision that can so seriously affect the lives, health, and happiness of so many people.

Thank-you.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT
Sent: Thursday, June 13, 2013 8:56 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

PM

MWD 87424

From: PUBCOMMENT-OCC
Sent: Wednesday, June 12, 2013 2:35 PM
To: PUBCOMMENT
Subject: FW: Public comment on Permit Number WQ0010539001

From: mmdaggett@yahoo.com [mailto:mmdaggett@yahoo.com]
Sent: Wednesday, June 12, 2013 2:14 PM
To: donotReply@tceq.state.tx.us
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Timothy M Daggett

E-MAIL: mmdaggett@yahoo.com

COMPANY:

ADDRESS: 15111 DIANA LN
HOUSTON TX 77062-2801

PHONE: 2819847407

FAX:

MWD

COMMENTS: Mary Melissa an mothy Daggett, 15111 Diana LN Hou ., TX 77062, Phone 281-984-7407 We formally request a public meeting to discuss the Clear Lake City Water Authority's (CLCWA) application to amend Texas Pollutant Discharge Elimination System (TPDES) PERMIT No. WQ001053900 (EPA I. D. No. TX 0022543) to authorize the addition of two outfalls. The Houston County Flood Control Drainage Canal B104-03-00 is less than 100 yards directly behind my house just before it crosses under Penn Hills LN. The Houston County Flood Control Drainage Canal B104-03-00, is the drainage ditch which the CLCWA intends to utilize for this sewage water dumping. I expect my house to lose value as the CLCWA begins to dump this sewage water directly into this drainage ditch. Kids now get into the water to catch turtles and fish, even though they aren't supposed to. Will they be safe with this sewage water flowing down this drainage ditch?

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, June 24, 2014 7:48 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 6/24

From: doylton.davis@gmail.com [mailto:doylton.davis@gmail.com]
Sent: Monday, June 23, 2014 2:57 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Doylton Davis

E-MAIL: doylton.davis@gmail.com

COMPANY:

ADDRESS: 1706 FAIRWIND DR
HOUSTON TX 77062-5433

PHONE: 2816861561

FAX:

COMMENTS: I support Exploration Green and I support the TCEQ issuing a permit to the Clear Lake City Water Authority. Directly behind my back yard is one of the old golf course ponds. The outfall pipe supplying water to the pond is about 200' from my back yard. When the golf course was active this outfall pipe supplied the type of water that is at issue with regards to this permit request. The water was pumped in on a regular basis. I never smelled any odor at all. The pond had plenty of fish, turtles, and ducks then as it still has now. Since the

MW

golf course has been closed the [illegible] water level has been stable without a [illegible] water. Which is the point I am trying to make right now is that I think Exploration Green's pumped water requirement will be very small so I think the alarmist and obstructionist fears are very over exaggerated. Also, the lack of progress is going to severely hurt property values. I do not want the progressive plan of Exploration Green to be thwarted by the emotional alarmist and obstructionist.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 02, 2014 9:07 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: doylton.davis@gmail.com [mailto:doylton.davis@gmail.com]
Sent: Thursday, May 29, 2014 2:43 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

MWD 07424

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Doylton Davis

E-MAIL: doylton.davis@gmail.com

COMPANY:

ADDRESS: 1706 FAIRWIND DR
HOUSTON TX 77062-5433

PHONE: 2816861561

FAX:

COMMENTS: 1. I support the Exploration Green project. I have lived on the old clear lake city golf course for 21 years. We have possibly the best view on the old golf course. 2. I am not afraid of the Exploration Green development of the old golf course as some people are. 3. I assume fear of change is prompting the alarmist, obstructionist, fear tactics being used. 4. Also, it appears someone is feeding their ego by developing a selfish forum to pontificate from with these alarmist and obstructionist comments. 5. The most immediate alarmist

MWD

statement with regards to the Ef[illegible]nt Water Permit is: "Dangers to childı[illegible]senior citizens, and others with a weakened immune system." 6. Unless the water district is advocating drinking the Effluent Water, or swimming in the Effluent Water, how would anyone come in contact with the water ? 7. I do not have a weakened immune system but if I drink the old golf course existing pond water or old golf course existing drainage ditch water I will get very sick.

TCEQ Public Meeting Form
May 29, 2014

(3)

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: DOYLTON DAVIS

Mailing Address: 1706 FAIRWIND HOUSTON, TX 77062

Physical Address (if different): _____

City/State: HOUSTON, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: DOYLTON.DAVIS@GMAIL.COM ✓

Phone Number: 281-686-1561

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

☑ **Please add me to the mailing list.** ✓

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

1. I support the Exploration Green project and I support the TCEQ permit application.

2. I have lived on the old clear lake city golf course for 21 years. I have walked around the old golf course many times. We have possibly the best view on the old golf course. But I am not afraid of the Exploration Green development of the old golf course that will create a new view.

3. I understand that change is a challenging confrontation that creates apprehension and misunderstanding. I think that this apprehension is prompting some of the alarmist, and obstructionist statements that I have read about regarding this permit application and the Exploration Green project.

4. The most immediate alarmist statement with regards to the Effluent Water Permit is:

"Dangers to children, senior citizens, and others with a weakened immune system."

5. Unless the water district is advocating drinking the Effluent Water, or swimming in the Effluent Water, how would anyone come in contact with the water ?

6. I do not have a weakened immune system but if I drink the existing pond water on the old golf course or drink the existing drainage ditch water on the old golf course I will get very sick.

7. Also, I think that referring to the CLCWA Exploration Green project as a "ditch" covering the entire width and length of the old golf course is alarmist and misleading.

8. I cannot see any advantage of stalling plans for the old golf course.

9. **Advantages of moving forward are:**

A. New indigenous healthy young trees get planted since trees do not live forever.
B. New nice hike and bike trails since the existing old golf cart paths are deteriating.
C. A plan for the future that will increase property values because people like new things and this is a new Eco friendly recreation area that will serve the community.

Doylton Davis
1706 Fairwind
Houston, TX 77062
281-686-1561

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, June 24, 2014 10:08 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: manypacatex@gmail.com [mailto:manypacatex@gmail.com]
Sent: Tuesday, June 24, 2014 8:39 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Elizabeth Del Bosque

E-MAIL: manypacatex@gmail.com

COMPANY:

ADDRESS: 1302 EL DORADO BLVD
HOUSTON TX 77062-3403

PHONE: 2817989349

FAX:

COMMENTS: My property is on the former golf course and next to an area where the water will flow very close to my home as it funnels under El Dorado Boulevard. I am not at all worried about the quality of the water as I believe the addition of the wetlands to filter the run-off as it enters and exits the detention area will benefit not only Clear Lake City residents, but the bayous and bays the run-off eventually enters. I believe this project will be a valuable and sorely needed asset to this community. We are severely lacking in safe areas to bicycle

MWD

and jog. This will get people off th ain roads and into areas more safe to . We anticipate an increase in property values as this will be an attractive place to live. I congratulate the CLCWA on their attempts to identify and save as many of the old native trees, especially the oaks, as they draw their plans. When Phase I is complete, I anticipate that we will see the volunteers pouring in to help get the next 4 phases moving along quickly, as well as grants and donations. Many thousands of volunteer hours have gone into carefully and thoughtfully planning the landscaping and wetlands for this property. It will be far more appealing and healthier to the environment than the algae-riddled ponds on the property now. Thank you for allowing me to express my enthusiastic support of the Exploration Green project.

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: BEVERLY & JACK DEMOSS

Mailing Address: 1654 NEPTUNE LANE
H 77062

Physical Address (if different): _____

City/State: _____ **Zip:** _____

This information is *subject to public disclosure under the Texas Public Information Act*

Email: bydemoss1@att.net

Phone Number: 713-906-5060

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

STATEMENT IN FAVOR OF THE EXPLORATION GREEN PROJECT

May 29, 2014

My name is Jack DeMoss. I live at 1654 Neptune Lane, Houston, TX 77062. I have been a customer of CLCWA for 48 years. They have done an outstanding job of providing us with good, clean, affordable water for the Clear Lake Area.

I am 100% in favor the Exploration Green Project. My wife and I have attended all the public meetings about this project and we are both in favor of this outstanding plan.

bjdemoss1@att.net
713-906-5060

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 01, 2014 7:44 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Note: Comment is attached to Enforcement item in error. This is a comment on the pending permit.

MWD 9/24

From: marlysdenison@mac.com [mailto:marlysdenison@mac.com]
Sent: Tuesday, September 30, 2014 6:47 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MS Marlys P. Denison

E-MAIL: marlysdenison@mac.com

COMPANY: MD&TP,LLC

ADDRESS: 1906 CARRIAGE BROOK WAY
HOUSTON TX 77062-4787

PHONE: 5129703231

FAX:

COMMENTS: I would like the Clear Lake Water Authority to help develop a great green space which will benefit us all. An opportunity like this does not present itself often and we all are entrusted with the chance to make a lasting monument to the good people in this area. It would be used for a very large radius of the project

and would help make the comm[illegible] more valuable in dollars and more v[illegible]ole in supporting the growth and development of the people who use it. Please do not let this opportunity slip by.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 11:45 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MUD 07424

From: dorrington@comcast.net [mailto:dorrington@comcast.net]
Sent: Thursday, May 29, 2014 9:25 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Beverly Dorrington

E-MAIL: dorrington@comcast.net

COMPANY:

ADDRESS: 16707 IVY GROVE DR
HOUSTON TX 77058-2210

PHONE: 2814611013

FAX:

COMMENTS: I support Exploration Green! and encourage you to do the same. Please issue the required permit.

MUD

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, October 13, 2014 8:17 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: thirdcoastroofing@gmail.com [mailto:thirdcoastroofing@gmail.com]
Sent: Monday, October 13, 2014 12:36 AM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Jayne Dowe

E-MAIL: thirdcoastroofing@gmail.com

COMPANY:

ADDRESS: 16665 SPACE CENTER BLVD
HOUSTON TX 77058-2253

PHONE: 2812285300

FAX:

COMMENTS: I do NOT support the Exploration Green project that is proposed by the Clear Lake City Water Authority. Specifically, I do not want the proposed Dog Park in my back yard. My property is limited to a 3-foot fence along the proposed era and the fence is easily jumped by even fairly small dogs. Additionally, my property is very close to the proposed dog park. There already is a dog park less than three miles away and, in the summer, the stench is horrific because the dog owners refuse to clean up after their animals. Many residents

who used to enjoy using the picn. .ciities at By My husband and I spent , i money for our home and do not need to have the malodor of dog feces wafting across our property to the point that we cannot enjoy our own back yard. Most residents who used to enjoy the picnic facilities at Bay Area Park, no longer can due to the strong, foul odor from the dog feces. Please help us save our Clear Lake green space and do not give it away to the dogs. It has been estimated that a single gram of dog waste can contain 23 million fecal coliform bacteria, which are known to cause cramps, diarrhea, intestinal illness, and serious kidney disorders in humans. According to the U.S. Centers for Disease Control and Prevention (CDC), pet droppings can contribute to diseases animals pass to humans, called zoonoses. When infected dog poop is deposited on your lawn, the eggs of certain roundworms and other parasites can linger in your soil for years. Anyone who comes into contact with that soil—be it through gardening, playing sports, walking barefoot or any other means—runs the risk of coming into contact with those eggs. Children are most susceptible, since they often play in the dirt and put things in their mouths or eyes. Please help preserve our groundwater and the cleanliness of Clear Lake and disapprove the proposed dog park in the Exploration Green for the health and welfare of our residents.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, October 13, 2014 10:43 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8/7/24

FYI...incorrectly attached to the Enf Order. Comment should be attached to the permit.

From: PUBCOMMENT-OCC
Sent: Monday, October 13, 2014 8:17 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: thirdcoastroofing@gmail.com [mailto:thirdcoastroofing@gmail.com]
Sent: Monday, October 13, 2014 12:36 AM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Jayne Dowe

E-MAIL: thirdcoastroofing@gmail.com

COMPANY:

ADDRESS: 16665 SPACE CENTER BLVD
HOUSTON TX 77058-2253

PHONE: 2812285300

FAX:

COMMENTS: I do NOT suppo .e Exploration Green project that is pr. ;ed by the Clear Lake City Water Authority. Specifically, I do not want the proposed Dog Park in my back yard. My property is limited to a 3-foot fence along the proposed era and the fence is easily jumped by even fairly small dogs. Additionally, my property is very close to the proposed dog park. There already is a dog park less than three miles away and, in the summer, the stench is horrific because the dog owners refuse to clean up after their animals. Many residents who used to enjoy using the picnic faciities at By My husband and I spent good money for our home and do not need to have the malodor of dog feces wafting across our property to the point that we cannot enjoy our own back yard. Most residents who used to enjoy the picnic facilities at Bay Area Park, no longer can due to the strong, foul odor from the dog feces. Please help us save our Clear Lake green space and do not give it away to the dogs. It has been estimated that a single gram of dog waste can contain 23 million fecal coliform bacteria, which are known to cause cramps, diarrhea, intestinal illness, and serious kidney disorders in humans. According to the U.S. Centers for Disease Control and Prevention (CDC), pet droppings can contribute to diseases animals pass to humans, called zoonoses. When infected dog poop is deposited on your lawn, the eggs of certain roundworms and other parasites can linger in your soil for years. Anyone who comes into contact with that soil—be it through gardening, playing sports, walking barefoot or any other means—runs the risk of coming into contact with those eggs. Children are most susceptible, since they often play in the dirt and put things in their mouths or eyes. Please help preserve our groundwater and the cleanliness of Clear Lake and disapprove the proposed dog park in the Exploration Green for the health and welfare of our residents.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, October 06, 2014 8:25 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

Note this is incorrectly attached to the Enforcement Order. It should be attached to the pending permit.

From: mjdyson@swbell.net [mailto:mjdyson@swbell.net]
Sent: Saturday, October 04, 2014 3:45 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Marianne Dyson

E-MAIL: mjdyson@swbell.net

COMPANY:

ADDRESS: 15443 RUNSWICK DR
HOUSTON TX 77062-3310

PHONE: 2814864747

FAX:

COMMENTS: I've lived in Clear Lake for more than 35 years and previously served on the CLCCA Board. The plan for Exploration Green is simply outstanding. I've read the reports, studied the plans, and I'm satisfied that the Water Authority will do a great job managing our water quality and prevent future flooding while providing a beautiful place for people of all ages to exercise, stay fit, and observe wildlife.

19

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT Mary Carol Edwards

Name: Mary Carol Edwards / Texas Coastal Watershed Program

Mailing Address: 1250 Bay Area Blvd Ste C

Physical Address (if different): _____

City/State: Houston TX **Zip:** 77058

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: mcedwards@tamu.edu ✓

Phone Number: 281-218-8100

- Are you here today representing a municipality, legislator, agency, or group? ☑ Yes ☐ No

  If yes, which one? TCWP / TX A&M Extension, TX Sea Grant

☐ **Please add me to the mailing list.** I'm on it.

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MC

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, June 26, 2014 1:34 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 3704

From: davideichblatt@gmail.com [mailto:davideichblatt@gmail.com]
Sent: Thursday, June 26, 2014 11:34 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: David Eichblatt

E-MAIL: davideichblatt@gmail.com

COMPANY:

ADDRESS: 2106 HILLSIDE OAK LN
HOUSTON TX 77062-3673

PHONE: 2814885179

FAX:

COMMENTS: We need to proceed with the development the water reclamation facility as planned. This development will provide for flood protection and recreational use of the property for the residents of Clear Lake City. It will provide a green space for walking, bike riding and other activities where none exists at present. It will provide for planting of trees also. Without this development, the land will sit dormant and be wasted. It would probably become unusable by the citizens for any type of recreation.

MWD

May 29, 2014

Re: Permit # WQ0010539001/ Clear Lake Water Authority

We oppose the effluent waste water in my backyard. My house backs up to the old golf course and we would be directly effected by this. I have a elderly mother that I take care of and this would further jeopardize her health.

I cannot find any other neighborhood that has this being done except a third world country. Please do not allow us to be guinea pigs.

Oakbrook resident
Dan ~~Ferguson~~ Finnegan

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, June 24, 2014 10:09 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

mwd 8/7/24

From: gfisseler@gmail.com [mailto:gfisseler@gmail.com]
Sent: Tuesday, June 24, 2014 8:06 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Gene Fisseler

E-MAIL: gfisseler@gmail.com

COMPANY:

ADDRESS: 15906 TURTLE BAY DR
HOUSTON TX 77062-4757

PHONE: 7135041962

FAX:

COMMENTS: I live in the subdivision (Bay Forest) adjacent to the proposed Exploration Green development. I have lived in Bay Forest since 1986. The ditch that drains the old golf course into Horsepen Bayou flows directly behind my home. I am a professional engineer with bachelors and masters degrees in civil engineering, specializing in water and wastewater treatment. As the water resources director for NRG Energy, I am familiar with the TCEQ wastewater discharge permiting process. I serve on the Region H Water Planning Group and on

mwd

the Trinity and San Jacinto Rivei sins and Galveston Bay Bay and Bay . . Stakeholdrer Committee. In addition, I am very familiar with - have worked regularly with - Exploration Green and the organizations that have come together to put it together. Those organizations include the Clear Lake City Water Authority, Lockwood Andrews & Neunam, Trees for Houston, Galveston Bay Foudation, and the Audubon Society to name a few. In the almost thirty years of living in the heart of Clear Lake, I have paid close attention to local flooding patterns, the health of the waterways in the area, canoed in Horsepen Bayou and Armand Bayou, toured the CLCWA wastewater treatment plant, and walked the entire golf course regularly. I am aware that the old golf course used treated effluent from CLCWA's treatment plant for irrigation and to keep the water traps full. Similarly, treated effluent from the plant is used at Bay Oaks golf course which adjoins my neighborhood on the northwest. Exploration Green will provide flooding relief to Clear Lake that will improve our quality of life. It will deliver outdoor recreational opportunities that are sorely needed. The project makes good use of reclaim water. In addition, it will result in new habitat in an urban area that all residents will enjoy. There is no justification for a contested hearing. The proposals included in the application are proven and well conceived. There is no historical or operational basis for delaying or complicating this process. In my personal and professional opinion based on my education and training, professional career, and personal knowledge with virtually every aspect of the project and its developers, I STRONGLY SUPPORT the issuance of permit WQ0010539001 with all due haste.

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: ~~Debra~~ Goode Debra Goode

Mailing Address: 3827 Partridgeberry Ct, Houston, TX 77059

Physical Address (if different): _____

City/State: Houston TX **Zip:** 77059

This information is *subject to public disclosure under the Texas Public Information Act*

Email: degmail1@sbcglobal.net ✓

Phone Number: 281-280-9944

- Are you here today representing a municipality, legislator, agency, or group? ☑ Yes ☐ No

  If yes, which one? EC

☑ **Please add me to the mailing list.** ✓

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MD

I am very satisfied with the quality of reuse CLCWA water.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, July 01, 2014 8:18 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD
o 7434

From: karen.gregory@centerpointenergy.com [mailto:karen.gregory@centerpointenergy.com]
Sent: Monday, June 30, 2014 4:52 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MS Karen Gregory

E-MAIL: karen.gregory@centerpointenergy.com

COMPANY:

ADDRESS: 16823 BURWOOD WAY
HOUSTON TX 77058-2310

PHONE: 8322794996

FAX:

COMMENTS: I would like to offer my support to the Clear Lake City Water Authorities Master Plan to convert the previous Clear Lake City Golf Course to Exploration Green, a community nature park, and trail way. For too many years our area of Houston has been underserved of green space, the City of Houston has offered very little support to local parks and green spaces, certainly compared to other parts of the city. Back about 10 years or so ago, the Renaissance Corporation purchased the golf course (claiming to continue to

operate it as a golf course) and ra nto the ground, basically making it u ble as a functioning golf course and shut it. They then announced plans to develop it...to the displeasure of most of the local citizens. So when the Clear Lake Water Authority stepped up to purchase the property from Renaissance to use for much need water run off retention but with the offer to also allow the citizens to access it for a local green space and walking trails it was so appreciated. A conservancy has been created to work with the Water Authority and through that an amazing master plan has been developed. It will be such a much needed amenity to our often underserved community. I realize there are a few unhappy folks who don't agree with the plan and are publishing false information about the potential water quality of the retention but they need to understand that the land will be developed one way or another. I choose the beautiful green space , not some ugly strip center or apartments. Leaving the land as is was never an option. (I don't believe any of the malcontents have offered to purchase the land to leave as is) Please support the great majority of Clear Lake citizens and work in harmony with our Clear Lake Water Authority. They are heroes to most of us.

11

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Jerry Hamby

Mailing Address: 14114 El Camino Real

Physical Address (if different):

City/State: Houston, Tx **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: jhamby4@comcast.net

Phone Number: 832 483-7443

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one?

☒ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Jerry Hamby

14114 El Camino Real
Houston, TX 77062
(832) 483-7443
jhamby4@comcast.net

May 29, 2014

To Members of the Texas Commission on Environmental Quality:

I am writing this letter in support of the Clear Lake City Water Authority and its application for a permit to channel reuse water into the waterways of Exploration Green. From an environmental standpoint, strategically releasing gray water is a wise practice since it will allow the CLCWA to make responsible use of a precious resource, and it will help to maintain the delicate ecosystems of the green space.

My wife and I have lived in the Clear Lake area for seventeen years (fifteen of those as home owners in Bay Pointe). We have witnessed firsthand the constant threat of flooding, and we applaud the innovative efforts of the CLCWA to help alleviate this problem. We have also attended several town hall meetings that reported on the planning stages of Exploration Green. More recently, we have volunteered to work in the on-site tree nursery.

The awards and accolades that Exploration Green have received in the past year are well deserved and will undoubtedly improve the quality of a first-rate park, one that thousands of Houstonians will enjoy for decades to come. None of this would have happened, of course, without the collective judgment, wisdom, research, and good will of the CLCWA Board members, who are looking out for the well-being of their fellow citizens. I have never been more proud to live in Clear Lake, and I look forward to seeing the tangible rewards of the Water Authority's planning and leadership.

I ask you to approve the CLCWA's environmental permit amendment (#WQ0010539001).

Sincerely,

Jerry Hamby

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Susan Hamby

Mailing Address: 14114 El Camino Real

Physical Address (if different): _____

City/State: Houston, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: shamby@lee.edu ✓

Phone Number: 832 226-2627

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MJ

Susan Hamby

14114 El Camino Real
Houston, TX 77062
(832) 226-2627
shamby@lee.edu

May 29, 2014

To Members of the Texas Commission on Environmental Quality:

I am writing this letter in support of the Clear Lake City Water Authority and its plan to channel reuse water into the waterways of Exploration Green. Careful release of gray water is a wise decision economically and ecologically. Water is an increasingly scarce resource, and the reuse plan will allow the CLCWA to flush the waterways that go through the park with water that would otherwise be wasted. The native plants that will eventually grow in the park will also benefit from the water release.

My husband and I have owned a home in Bay Pointe for more than fifteen years. Although we are not required to do so, we have always maintained a flood insurance policy, knowing only too well how prone the Clear Lake area is to flooding (as we once again witnessed this week). A key component of the development of Exploration Green is to deepen and extend the waterways to catch run-off water.

In the past two years, my husband and I have attended informational meetings sponsored by the CLCWA , and we have eagerly followed the development stages of Exploration Green. In the last two months, we have also worked in the park, along with dozens of other volunteers, repotting trees donated by Trees for Houston. This spirit of community involvement and activism has been possible because of the leadership of the Water Authority.

Exploration Green will undoubtedly become a space that Houstonians will be proud to call their own. I ask you to approve the CLCWA's environmental permit amendment (#WQ0010539001).

Sincerely,

Susan Hamby

Susan Hamby

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 8:11 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: kirk@shbi.org [mailto:kirk@shbi.org]
Sent: Wednesday, May 28, 2014 3:22 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: D Kirk Hayes

E-MAIL: kirk@shbi.org

COMPANY:

ADDRESS: 822 PRAIRIE BROOK CT
HOUSTON TX 77062-2198

PHONE: 8064386256

FAX:

COMMENTS: I respectfully request that the CLCWA not be permitted to carry out their proposed plan as is. There is a more economically and ecologically responsible plan proposed by residents fronting the old golf course. The destruction of so many mature trees and so much wildlife habitat seems out-of-step with our increasingly ecologically-minded society. Please consider the alternative plan produced by Steve Baxter. You can view it at this link: http://www.savetheogc.org/our-plan.html Blessings, Kirk Hayes

MWD

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TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Carole Henning

Mailing Address: 2006 Saxkale

Physical Address (if different): _____

City/State: Houston TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: dancerclt@sbcglobal.net

Phone Number: 281-486-4154

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MW

Comments: **AGAINST** TCEQ permit WQ0010539001

Carole Henning, Re: TCEQ permit WQ0010539001

I am opposed to the Clear Lake City Water Authority project WQ0010539001 which would allow a river of undiluted treated sewage effluent to run through a ditch in the middle of Clear Lake City, an existing residential community. I can find no examples in the literature of undiluted treated sewage effluent being pumped directly into an existing community in the United States. As a result, there are no studies on the public health effects of 24/7 exposure to this product. Even workers in waste treatment plants do not endure 24/7 exposure to this effluent.

Under the CLCWA plan, large areas of protected wetlands will be developed adjacent to resident's homes. These cannot be sprayed for mosquitoes. The often said idea that biological mosquito predators will control the population is scientifically incorrect(8). This will result in a heavy mosquito population. Since the CLCWA project allows for significant numbers of disease carrying vectors such as mosquitoes and current state standards do not test for diseases such as West Nile Virus or vector spread (Duck/bird excrement) pathogens like Giardia Lambia, the risk to the population of Clear Lake City from vector caused diseases could be substantial.

It is your job is to protect public health and there is no research to support the safety of long term, 24/7 exposure to this undiluted effluent. This project makes the residents of Clear Lake City, guinea pigs, in a massive unmonitored health study. This is not protecting the public health.

In addition, you are setting a precedence which would allow any Municipal Utility District to use any ditch or create a ditch inside an existing community and fill it with treated sewage water. This will quickly be seen as a significant cost saving from current practices of pumping it a distance from the plant to an isolated wetland or aquifer recharge area. Once you permit a river of undiluted treated sewage effluent in residential communities, it will be hard to refuse additional requests.

While the CLCWA contends that this effluent is above state standards, Texas standards are among the weakest in the nation. Texas waste water effluent can contain up to 10 to 20 times the fecal bacteria levels allowed by neighboring states.

And by using the largely discredited single indicator method, the levels of hundreds of other human fecal transported pathogens are an unknown. (11) Many highly chlorine resistant pathogens will continue to flourish in this undiluted effluent. Also of increasing concern is the level of endocrine altering pharmaceutical by-products untested, unmonitored and unfiltered by current waste water treatment practices. By allowing this project as currently designed, hundreds of acres of pathogenic and possibly pharmaceutical contaminated soils will be created.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

I urge you to protect the health and safety of the 1000 plus residents who live within a 1000 feet of this proposed project and the 596 children at Clear Lake City Elementary who will be exposed regularly to this unknown health risk. Without public health studies on the long term effects of undiluted treated sewage effluent, this proposal is premature. I recommend that you disapprove this request.

Carole Henning, 5/29/14, 2006 Seakale Lane, Houston, Texas 77062

References:

1) Final Report, State of technology of Water Reuse, Texas Water Development Board
2) FAQ, Texas Water Development Board
3) Report on Water Reuse, National Academy of Sciences, (via Texas Water Development Board, innovative water)
4) Hygiene Aspects of Greywater and Greywater Reuse, Royal Institute of Technology, Department of Land and Water Resources Engineering, Department of Water and Environmental Microbiology, Swedish Institute for Infectious Disease Control
5) Control of Water Borne Diseases in Reuse Water report, National Academy of Sciences, Understanding the Risks, pg 101-122
6) Health issues related to drainage water management, Vector-borne diseases, water based diseases, Food and Agricultural Organization of the United Nations
7) Control of pathogenic microorganisms in wastewater recycling and reuse in agriculture, Shuval & Fattaff, The Hebrew University of Jerusalem, Israel.
8) Biological Mosquito Control, Emerging Disease issues, Michigan State government
9) Regrowth of Potential Opportunistic Pathogens and Algae in Reclaimed-Water Distribution Systems, National Institute of Health, United States.
10) Water Reuse, Health Risks, Mission: Clean Water 2012, Massachusetts Institute of Technology
11) Effect of chlorine in inactivating selected pathogens, Safe Water Systems, Center for Disease Control, United States.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT
Sent: Wednesday, May 15, 2013 3:22 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

PM

From: PUBCOMMENT-OCC
Sent: Wednesday, May 15, 2013 2:57 PM
To: PUBCOMMENT
Subject: FW: Public comment on Permit Number WQ0010539001

From: ogcbirder77062@gmail.com [mailto:ogcbirder77062@gmail.com]
Sent: Wednesday, May 15, 2013 2:44 PM
To: donotReply@tceq.state.tx.us
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Carole Henning

E-MAIL: ogcbirder77062@gmail.com

COMPANY:

ADDRESS: 2006 SEAKALE LN
HOUSTON TX 77062-6118

PHONE: 2814864154

FAX:

mwd

COMMENTS: I request a publi[illegible]ing on the amendment request mad[illegible]e Clear Lake Water Authority, permit WQ0010539001

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 11:45 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 97424

From: gus-homann@ix.netcom.com [mailto:gus-homann@ix.netcom.com]
Sent: Thursday, May 29, 2014 9:06 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Gus Homann

E-MAIL: gus-homann@ix.netcom.com

COMPANY:

ADDRESS: 874 SEAMASTER DR
HOUSTON TX 77062-5104

PHONE: 2814804936

FAX:

COMMENTS: I fully support the CLCWA in its efforts to create Exploration Green for the community. Any permits needed for this project should be granted. This project is a win-win for the community.

MWD

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014

PLEASE PRINT

AT PUBLIC MEETING

Name: Mary Ann Howard

Mailing Address: 16003 Diana Ln

Physical Address (if different): 16003 Diana Ln

City/State: Houston, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: precinct745@gmail.com

Phone Number: 281-488-8180 - 832-498-1456

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Mary Howard
to Precinct745@gmail.com

5/29/2014 1:02 PM

Effluent Water/TCEQ

1. Has the CLCWA completed the required Environmental Impact Assessment (EIA) & Study for this requested amendment to WQ0010539001? Did the results pass minimum Texas & Corp. of engineers requirements?
2. Have the Study results been made available to the citizens of the water district as well as the TCEQ?
We have not been able to obtain a copy.
3. Effluent water use in Texas is legally limited to spraying fairways, lawns & to mixing with natural flowing waterways.
Example: The San Antonio River Walk mixes effluent water with a natural flowing river. This proposed amendment to WQ0010539001 is in violation of that standard. It will put huge amounts (2,160,000 gallons per day) of pooling (7 feet deep) effluent water in a non-natural, yet-to-be excavated set of retention ditches.
The areas to be excavated have no naturally flowing water & would be positioned below currently existing Harris County Flood Control detention ditches on the dry golf course.
This requested amendment to WQ0010539001 should be totally denied by the TCEQ.

Regards

Mary Ann Howard
16003 Diana Lane
Houston, Texas 77062

832-498-1456.....cell
281-488-8180.....Home

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

TEXAS COASTAL WATERSHED
P R O G R A M

March 26, 2015

MWD 07424

REVIEWED
APR 0 7 2015
By

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
2015 APR -7 AM 9:50
CHIEF CLERKS OFFICE

Bridget C. Bohac, Chief Clerk
TCEQ, MC-105
P.O. Box 13087
Austin, TX 78711-3087

RE: Clear Lake City Water Authority TPDES Permit # WQ 001010539001

I have received a copy of the March 6 letter indicating your Executive Director's opinion that the application above meets the requirements of applicable law. It is noted that the possibility of a contested case hearing is still open. We encourage that the permit approval move forward without additional delay. It has been over two years since the permit was filed and that has been ample time for anyone to present their case.

In a partnership with the Clear Lake City Water Authority, the Texas Coastal Watershed Program (TCWP), a program of the Texas A&M University System, applied for and received grant funding to study the hydrology of the site in order to optimally design the wetlands so that they can effectively cleanse stormwater runoff flowing into the detention ponds. The TCWP also designed, built, and operates a wetland plant nursery onsite. That nursery hosts weekly volunteer workdays with community members and Texas Master Naturalists to build up plant stocks for the planned wetlands.

When planted, the wetlands will go through a period of establishment where they will need consistently wet soil. Using fresh potable water for irrigating acres of new wetlands would be a great waste of resources. The permit for incorporating reuse water, however, allows the wetland plants to establish themselves and thrive. Time is of the essence, however, and it is critical that this reuse water be available in the very near future.

Thank you for your consideration in this matter.

John S. Jacob, Ph.D., PG, PWS
Director, Texas Coastal Watershed Program
Professor and Extension Specialist
Department of Recreation, Park, and Tourism Sciences

Texas A&M University System
Texas AgriLife Extension Service / Texas Sea Grant
1250 Bay Area Blvd., Suite C
Houston, TX 77058

Office: (281) 218-0570
Fax: (281) 218-6352
tcwp.tamu.edu

TEXAS
COMMISSION
ON ENVIRONMENTAL
QUALITY

2015 APR -7 AM 9:49

CHIEF CLERKS OFFICE

Office of the Chief Clerk, MC105
TCEQ
P.O. Box 13087
Austin, TX 78711-3087

RECEIVED
APR 07 2015
TCEQ MAIL CENTER
JH

78711308787

HOUSTON TX 770
03 APR 2015 PM 9 L

15846 Scenic View Dr.
Houston, TX 77062

Copy faxed on April 2

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
2015 APR -3 PM 2:05
CHIEF CLERKS OFFICE

TEXAS COASTAL WATERSHED PROGRAM

March 26, 2015

REVIEWED
APR 06 2015
By

Bridget C. Bohac, Chief Clerk
TCEQ, MC-105
P.O. Box 13087
Austin, TX 78711-3087

MWD 07424

RE: Clear Lake City Water Authority TPDES Permit # WQ 001010539001

I have received a copy of the March 6 letter indicating your Executive Director's opinion that the application above meets the requirements of applicable law. It is noted that the possibility of a contested case hearing is still open. We encourage that the permit approval move forward without additional delay. It has been over two years since the permit was filed and that has been ample time for anyone to present their case.

In a partnership with the Clear Lake City Water Authority, the Texas Coastal Watershed Program (TCWP), a program of the Texas A&M University System, applied for and received grant funding to study the hydrology of the site in order to optimally design the wetlands so that they can effectively cleanse stormwater runoff flowing into the detention ponds. The TCWP also designed, built, and operates a wetland plant nursery onsite. That nursery hosts weekly volunteer workdays with community members and Texas Master Naturalists to build up plant stocks for the planned wetlands.

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Thank you for your consideration in this matter.

John S. Jacob, Ph.D., PG, PWS
Director, Texas Coastal Watershed Program
Professor and Extension Specialist
Department of Recreation, Park, and Tourism Sciences

Texas A&M University System
Texas AgriLife Extension Service / Texas Sea Grant
1250 Bay Area Blvd., Suite C
Houston, TX 77058

Office: (281) 218-0570
Fax: (281) 218-6352
tcwp.tamu.edu

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 23, 2014 10:16 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 37424

From: ggjay@sbcglobal.net [mailto:ggjay@sbcglobal.net]
Sent: Monday, June 23, 2014 10:12 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Gordon G Johnson

E-MAIL: ggjay@sbcglobal.net

COMPANY: - select -

ADDRESS: 2010 FAIRWIND DR None
HOUSTON TX 77062-4514

PHONE: 2814883032

FAX:

COMMENTS: I am a home owner in Clear lake city (Houston) ands have lived on the former golf course for over forty years. I am a strong supporter of the CLCWA plans for the land as are my neighbors, the Kochners and Mr. Young who also live on the former gulf course. I support the amendment to the permit.

mw

(7)

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: GORDON JOHNSON

Mailing Address: 2010 FAIRWIND RD

Physical Address (if different): _____

City/State: HOUSTON TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: _____

Phone Number: _____

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? CLCWA

☒ **Please add me to the mailing list.** ✓

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mw

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, July 01, 2014 8:23 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 6-24-14

From: nc-cl-tx@sbcglobal.net [mailto:nc-cl-tx@sbcglobal.net]
Sent: Monday, June 30, 2014 4:15 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Nancy Johnson

E-MAIL: nc-cl-tx@sbcglobal.net

COMPANY: Ms.

ADDRESS: 2010 FAIRWIND DR
HOUSTON TX 77062-4514

PHONE: 2814883032

FAX:

COMMENTS: I believe most if not all of the opposition to this permit addition is an attempt to stop the Exploration Green Plan by a minority of the people affected by it. The community at large has supported and contributed to the outcome by volunteering their time and energy, contributions and ideas to come to the realization of the plan. Now there are some who will say and do anything to try to stop it, and they are in the minority. There are also some who oppose the plan and don't even live on the old golf course. I hope that you

will approve the planned addition t .ow the reuse water to flow in our be .ul detention/retention ponds and we can all benefit from less flooding in the streets when the rain comes down in excess in the future. Thank you, Nancy Johnson (A 42 year resident on the old golf course property) 2010 Fairwind Road Houston, TX 77062 281 488 3032

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, May 28, 2014 12:01 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD @7424

From: nc-cl-tx@sbcglobal.net [mailto:nc-cl-tx@sbcglobal.net]
Sent: Wednesday, May 28, 2014 11:00 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MS Nancy Johnson

E-MAIL: nc-cl-tx@sbcglobal.net

COMPANY:

ADDRESS: 2010 FAIRWIND DR
HOUSTON TX 77062-4514

PHONE: 2814883032

FAX:

COMMENTS: I am in favor of the proposed permit application. My home is located on the former golf course property and I believe the flow of additional water will benefit our area. Thank you.

MWD

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Nina Johnston

Mailing Address: 1402 Redway Ln

Physical Address (if different): _____

City/State: Howston TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: ninajohnston4@gmail.com ✓

Phone Number: 281-543-7444

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? Exploration Green

☒ **Please add me to the mailing list.** ✓

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓ on back

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MW

I am in full support of the CLCWA Board's master plan for the OGC.

Please support their effort to make our neighborhood the best it can be.

Thankyou

Nina Johnston

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, June 26, 2014 4:24 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: robert.e.jones-2@nasa.gov [mailto:robert.e.jones-2@nasa.gov]
Sent: Thursday, June 26, 2014 4:22 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Robert Jones

E-MAIL: robert.e.jones-2@nasa.gov

COMPANY:

ADDRESS: 16610 CLIFFROSE LN
HOUSTON TX 77062-5906

PHONE: 2812161162

FAX:

COMMENTS: I have been a resident of this address since 1984 and a Master Plumber since 1980. The reason I say this because I've worked around sewage treatment plants many times and have no problem with treated water going into these ponds, which seems to be the biggest bone of contention with some of the homeowners.I can understand people being resistent to change but for one , this is a small faction of homeowners for the rest of us have waited long enought for this project to move forward.Please give the Water Authority the proper

permits to move forward with this project,this is an old neighborhood and in time people of all walks of life will benefit from it and will be a big plus for the area. Thank You

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: John M. Keller

Mailing Address: 1710 Fairwind Rd

Physical Address (if different): _____

City/State: Houston, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: JL-cmtpdc@sbcglobal.net ?

Phone Number: _____

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mc

I, JOHN KELLER, support the Exploration grey Project and wish to approve the Permit.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 01, 2014 1:04 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: egking@sbcglobal.net [mailto:egking@sbcglobal.net]
Sent: Wednesday, October 01, 2014 12:39 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Ellen Goodrich King

E-MAIL: egking@sbcglobal.net

COMPANY:

ADDRESS: 15818 TORRY PINES RD
HOUSTON TX 77062-4513

PHONE: 2814803868

FAX:

COMMENTS: I strongly SUPPORT the Exploration Green plans. I have lived in Clear Lake City since 1967 and in my present house since 1973. It is located on the old Golf Course, and we have seen the rise and fall from "the glory days" of the original plans down to the deterioration of the course. Since the Clear Lake City Water Authority has acquired the property to attempt to improve flooding problems that exist, there has only been forward thinking and planning. The Exploration Green master planners have done a superb job of

instituting solutions to not only ma. ooding less of an issue, but they hav so made long range plans for a community friendly use of the area. Where the golf course only served some, these plans include the entire community. I realize that it will take many years to complete the entire project, but I strongly believe that it will enable this entire area to serve as a model for positive change. I have not made comments as to the "reuse water" issue. I leave that to the experts. Fortunately, I was able to attend several of the court hearings during the process of the CLCWA acquisition of the land. We are in extremely competent, caring hands with the people who have been guiding us in this process. While there are always objections to every road ever taken, I do believe that this entire process has been dealt with honestly and with intelligent assessments. To continue to delay a positive plan is only detrimental.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 8:09 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: kkochner@comcast.net [mailto:kkochner@comcast.net]
Sent: Thursday, May 29, 2014 1:44 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Kimberly Kochner

E-MAIL: kkochner@comcast.net

COMPANY:

ADDRESS: 2014 FAIRWIND DR
HOUSTON TX 77062-4514

PHONE: 2814802393

FAX:

COMMENTS: As a 26-year resident within the Clear Lake City Water Authority (CLCWA), I have been pleased with the outstanding quality and service of the CLCWA and the commitment of the board members to plan for the future and to protect our community from flooding. I am excited about the Exploration Green project. As a 21-year homeowner of a property that is on (or backs up to) the proposed Exploration Green project-Phase 2, I am impressed with the amount of planning that went into the design of this comprehensive

and aesthetically pleasing way to p ide the community with flood contro d water detention while continuing to keep the recreational aspect of the "old golf course" property. It is my understanding that a similar method of providing water for the ponds and wetlands of this project will be used as was previously used with the old golf course ponds. I feel confident that the CLCWA is taking the required steps to assure that the quality of water used for any wetlands in Exploration Green is safe for plants, wildlife and members of the community. I am in favor of the TCEQ approving the CLCWA application for the required permit so that the Exploration Green project can continue as planned. I do have a question I was hoping you could answer. In a recent election for the CLCWA Board, one of the candidates was promoting a better plan he had designed for flood control and water detention than that proposed by the Exploration Green project. So my question is: Can an architect design plans for flood control? If so, are there any special certifications or requirements needed for an architect to design flood control/water detention plans? If not, who can design flood control/water detention?

TCEQ Public Meeting Form
May 29, 2014

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: Noel Lampazzi

Mailing Address: 1215 El Dorado Blvd

Physical Address (if different): _____

City/State: Houston, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: noel.lampazzi@bucknell.edu ✓

Phone Number: 832-264-4934

- Are you here today representing a municipality, legislator, agency, or group? ☑ Yes ☐ No
  If yes, which one? Resident of the old golf course

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

I would like to say that
I have reviewed the plans
provided by Exploration Green etal.
& have no issues with them.

I am aware of the fact that
the Tallow trees will be torn down, potentially
with many other species but that they will be
replaced by new trees which are native, & are
currently being grown.
I'm also aware that treated sewage
will be used. all good with me.

Best,

Noel Lampasy

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MAY 29 2014
AT PUBLIC MEETING

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Emily Louviere

Mailing Address: 1914 Fairwind Rd.

Physical Address (if different): _____

City/State: Houston **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: emilycate26@yahoo ✓

Phone Number: 832.763.4817

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.** ✓

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mw

May 29, 2014

Re: Permit # WQ0010539001/ Clear Lake Water Authority

I strongly oppose to the pumping of treated sewer water in my backyard. Our health cannot be guaranteed and as a parent and pet owner, this is unacceptable. The pathogens and bacteria that our family would be exposed to would be unknown. We have lots of wildlife that also calls this land its home, all of these creatures would be at risk.

I also can imagine the day that everything overflows due to a storm or hurricane and all the "effluent" gets washed into our homes. What then??

Thank you for listening.

Emily Louviere

Emily Louviere

Oakbrook resident.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 02, 2014 9:06 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: mannytx@hotmail.com [mailto:mannytx@hotmail.com]
Sent: Friday, May 30, 2014 8:48 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Manny Manny Manny

E-MAIL: mannytx@hotmail.com

COMPANY:

ADDRESS: 1902 FAIRWIND DR
HOUSTON TX 77062-5435

PHONE: 2816524444

FAX:

COMMENTS: I agree that the area be declared national park. right now there are three pond that will increase its size .. but not all the green area and create a staff responsible for the maintenance of these areas

MW

Melissa Schmidt

From: PUBCOMMENT-OCC
Sent: Monday, June 24, 2013 10:12 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD
87424

PM

From: davmcc@hotmail.com [mailto:davmcc@hotmail.com]
Sent: Monday, June 24, 2013 7:20 AM
To: donotReply@tceq.state.tx.us
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: David McCorquodale

E-MAIL: davmcc@hotmail.com

COMPANY:

ADDRESS: 2019 BONANZA RD
HOUSTON TX 77062-6102

PHONE: 2818131606

FAX:

COMMENTS: I am against the dumping of waist water in our area. I would like to request a meeting to protest this. David McCorquodale

MS

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 8:10 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MUD 87424

From: themclane@hotmail.com [mailto:themclane@hotmail.com]
Sent: Wednesday, May 28, 2014 10:38 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR James C McLane, III

E-MAIL: themclane@hotmail.com

COMPANY:

ADDRESS: 1702 FAIRWIND DR
HOUSTON TX 77062-5433

PHONE: 7134447839

FAX:

COMMENTS: Over the Easter holidays on 1963 my father and I stopped at a little temporary sales office on NASA Road #1 and I watched him commit to buy what was probably the first house sold in Clear Lake City. We moved in that fall and the home is still in my family. It's located on Fairwind Road, directly opposite the old elementary school. I lived there in the 1960's while going to college and intermittently ever since then. The rear of the house opens onto the old Clear Lake City golf course and a large golf course duck pond is immediately

behind my back yard. I was disapp ed when the old CLC golf course ce to exist. That feature was the major attraction that Friendswood Development Company used to sell houses, and there was never any suggestion that the land might someday cease being a golf course. The proposal that the former CLC golf course be re-contoured to control flooding is really preposterous since in the 50 years I have lived there, my lot and no other lots in my neighborhood has ever come close to close to flooding except for some localized street flooding due to clogged storm sewer inlets. The notion of dumping incompletely treated sewage into ponds on the old Golf Course is really bizarre. In the 5 decades I've lived next to the larger duck pond, I have watched literally hundreds of children and adults fishing in that little lake, taking the fish home to (presumably) eat. I've seen dozens of kids swimming there. Two of my neighbor's infant children drowned in that little lake. Sometimes the kids sneak over to swim in the pond at night. Teachers from the elementary school take students to visit the pond for nature studies. - And this is the place where it is proposed to dump partially treated sewage? It doesn't take a rocket scientist to realize that indeed there is an obvious and significant health hazard associated with that sort of thing. I don't believe anyone can keep kids away from the pond, even if an unsightly fence were installed. Please don't permit dumping water with human waste into ponds on the former golf course; it's a really stupid idea.

Marisa Weber

From: PUBCOMMENT
Sent: Friday, May 17, 2013 9:59 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

PM

MWD 8742 LT

From: PUBCOMMENT-OCC
Sent: Friday, May 17, 2013 7:19 AM
To: PUBCOMMENT
Subject: FW: Public comment on Permit Number WQ0010539001

From: cella909@yahoo.com [mailto:cella909@yahoo.com]
Sent: Thursday, May 16, 2013 9:34 PM
To: donotReply@tceq.state.tx.us
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Marcella Mendoza

E-MAIL: cella909@yahoo.com

COMPANY:

ADDRESS: 15842 SEAHORSE DR
HOUSTON TX 77062-6222

PHONE: 2818535075

FAX:

mc

COMMENTS: I would like to re t a public meeting regarding this top want to understand what the specifics of the proposal and have the ability to have a public question and answer session.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, April 01, 2015 8:20 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001
Attachments: PJM_20150331_TCEQ_Letter_Contested_Case_Hearing.PDF

MWD 07424

From: Paul.Morris@sbcglobal.net [mailto:Paul.Morris@sbcglobal.net]
Sent: Tuesday, March 31, 2015 9:05 PM
To: DoNot Reply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Paul Morris

E-MAIL: Paul.Morris@sbcglobal.net

COMPANY:

ADDRESS: 14922 SUN HARBOR DR
HOUSTON TX 77062-2828

PHONE: 8322214513

FAX:

COMMENTS: See attached PDF document. -PJM

MW

Paul J. Morris
14922 Sun Harbor Dr.
Houston, Texas 77062-2828
Paul.Morris@sbcglobal.net
832-221-4513 (cell)

March 31, 2015

Mr. Richard A. Hyde, P.E., Executive Director,
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, TX 78711-3087

RE: Contested Case Hearing Request
Clear Lake City Water Authority
Customer Number: CN 600270102
Regulated Entity Number: RN 101440485
TPDES Permit Number: WQ0010539001

Dear Mr. Hyde,

I hereby request the TCEQ **deny contested case hearing requests** originating from a form letter circulated by opponents of the Exploration Green project. And I request the TCEQ approve the above referenced Clear Lake City Water Authority (CLCWA) permit amendment that is integral to the project.

The opponents have presented selected information in their letter, which I have addressed below.

Assertion: *"...and where 1,080,000 gallons per day of partially treated effluent water will slowly flow & pool in acres of man-made swampy wetlands & new retention ditches."*

Response:

- In accordance with the current permit, the CLCWA treats municipal wastewater to TCEQ Type II reclaimed water standards and has redundant systems to ensure continued treatment in case of an upset in the primary treatment system. A review of 2013 monthly Discharge Monitoring Report (DMR) data show the CLCWA discharge usually meets TCEQ Type I reclaimed water standards.

- The permit amendment to authorize up to 1,080,000 gallons per day for each outfall (Outfall 002 and Outfall 003) does not equate to discharging the permit maximum daily. The additional outfalls will provide the CLCWA with operating flexibility. They will be primarily used on an as-needed basis to ensure stormwater filtering wetlands created by the Texas A&M Coastal Watershed Program, under a grant from the TCEQ, remain viable during extended periods without rain.

Assertion: *"A project this massive has never been added to a fully occupied residential area and TCEQ permitted in Texas. Therefore the biological & health impacts are currently not quantifiable."*

Response:

- TCEQ staff responded to these concerns in response to Comments #1 and #3, that the proposed permit amendment will be protective of human health and the environment in accordance with current Texas laws. The TCEQ has traditionally based its regulations and permit determinations on sound, established science. Denying permits and amendments to permits based on speculative outcomes departs from TCEQ past practices and would create uncertainty in the permitting process.

Assertion: *"My FEMA flood insurance category will change to a more hazardous flood zone because of my properties new proximity to the effluent water. As a result, my annual costs rate will increase by 30%."*

Response:

- TCEQ clearly stated in response to Comment #16: *"The Commission does not have jurisdiction to regulate flooding or erosion in the context of a wastewater discharge permit. However, to the extent that an issue related to flooding also involves water quality, the Applicant is required to comply with all the numeric and narrative effluent limitations and other conditions in the proposed permit at all times, including during flooding conditions."* To the extend TCEQ can address 100-year flood plain, TCEQ requires the wastewater treatment unit to be protected from inundation. This is not the same as the discharge point(s).

Assertion: *"Per general discussions with local realtors, my property value will decrease by as much as 15% (estimated @ $20,000 to $30,000) during the CLCWA planned 15 year development period [excavation & construction] of this project."*

Response:

- TCEQ clearly stated in response to comment #37: *"Section 26.027 of the Texas Water Code authorizes the TCEQ to issue permits to control the discharge of wastes or pollutants into state waters and to protect the water quality of the state's rivers, lakes and coastal waters. The water quality permitting process is limited to controlling the discharge of pollutants into water in the state and protecting the water quality of the state's rivers, lakes, and coastal waters. The TCEQ does not have jurisdiction under the Texas Water Code or its regulations to address or consider property values, taxes, or the marketability of adjacent property in its determination of whether or not to issue a water quality permit."* Further, there is no consensus among local realtors regarding the impact on property values. Other realtors approached by the pro-Exploration Green residents believe retrofitting stormwater detention facilities to mitigate street flooding and converting the former golf course property to a nature preserve with

native species plants will enhance property values of the 50-year old Clear Lake City community.

Assertion: *"My CLCWA District taxes will increase as the board issues new bonds to pay for this currently unfunded $50 million project."*

Response:

- Voters in the City of Houston approved a stormwater drainage fee during elections held 11/02/2010, and City Council on 04/06/2011 adopted implementation ordinances. The City of Houston encompasses nearly all of the Clear Lake City Water Authority. The CLCWA mandate already includes stormwater management. The CLCWA entered into an intergovernmental agreement with the City of Houston on 05/09/2013 to alleviate City of Houston residents living within the CLCWA from paying the drainage fee, in effect double taxation. In return, the CLCWA must spend the equivalent of the City of Houston drainage fee collections on stormwater mitigation projects. This amount is approximately $2.5 million per year that the CLCWA must devote to stormwater mitigation. If the CLCWA fails to spend this amount, it must be forfeited to the City of Houston, with no assurance the funds would be spent on stormwater mitigation in the Clear Lake area (loss of local control). The approximately $2.5 million per year will fully fund the excavation portion of the Exploration Green project, which comes nowhere close to the grossly inflated $50 million project cost opponents claim.

If you have questions or need clarification on any point, please contact me by any of the means listed on the header of page one.

Sincerely,

Paul J Morris

Paul J. Morris

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 08, 2014 8:11 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001
Attachments: Clear_Lake_20141006_Flooding.pdf

MWD 87424

From: Paul.Morris@sbcglobal.net [mailto:Paul.Morris@sbcglobal.net]
Sent: Tuesday, October 07, 2014 10:02 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Paul Morris

E-MAIL: Paul.Morris@sbcglobal.net

COMPANY:

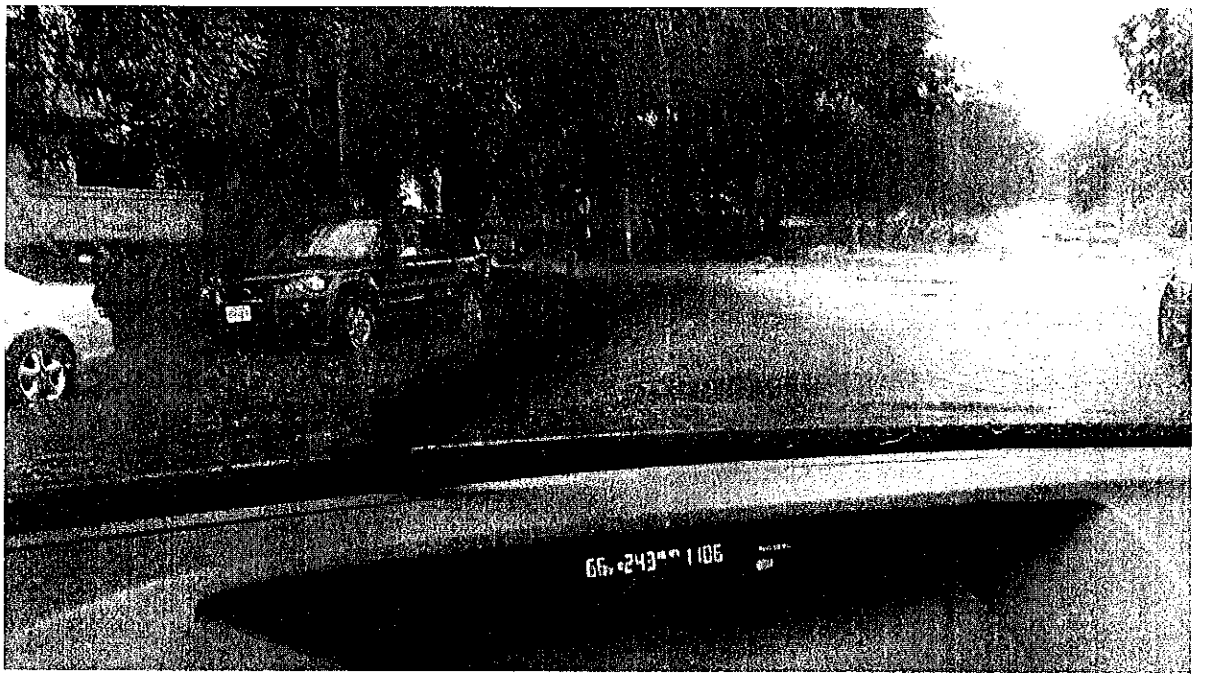
ADDRESS: 14922 SUN HARBOR DR
HOUSTON TX 77062-2828

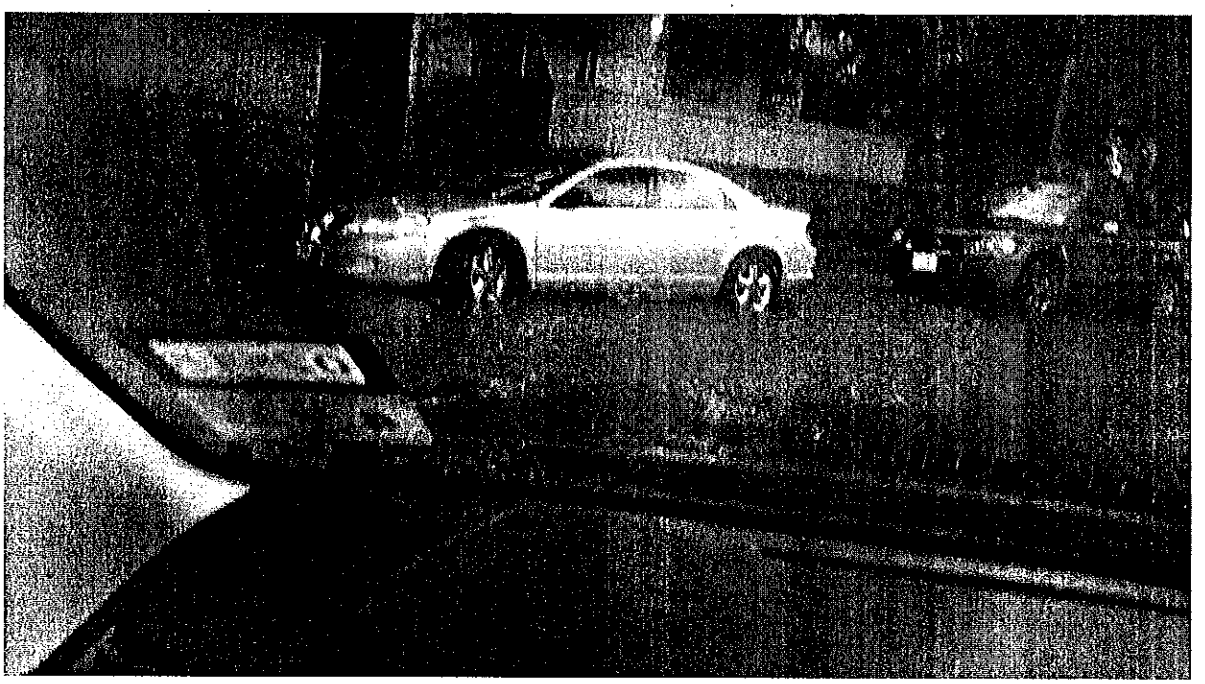
PHONE: 8322214513

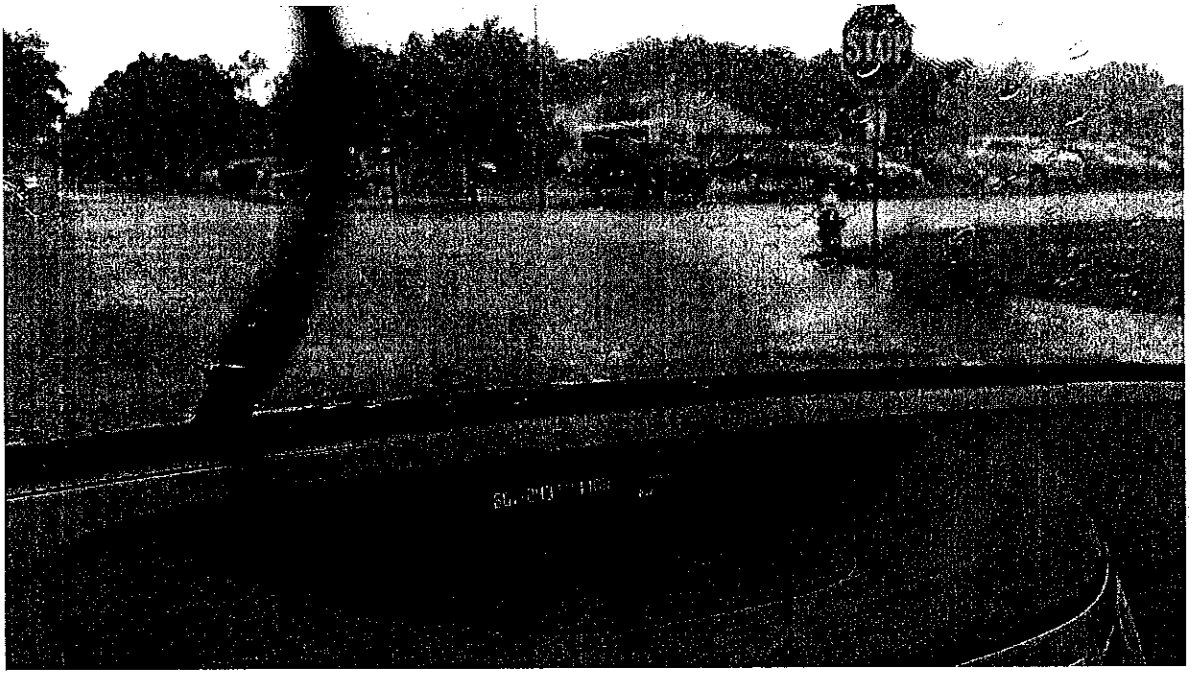
FAX:

COMMENTS: I have already submitted comments twice favoring TCEQ's issuance of this permit amendment. My first comments at the 05/29/2014 public meeting used the CLCWA's DMR report data to demonstrate the reuse water fully meets Type 2 reuse water standards and usually meets Type 1 reuse water standards. I also summarized a TCEQ study on the Armand Bayou watershed showing the CLCWA reuse water discharged is

better than the receiving waters. I subsequently submitted written comment the TCEQ website summarizing the results of the CLCWA board election, wherein candidates supporting the project defeated those opposed by a margin of more than 3-to-1, demonstrating broad-based community support. In comments to the TCEQ dated 09/24/2014, Chuck Howard asserted CLCWA plans to pump the permit maximum to the proposed outfalls 002 and 003. This is simply not true. CLCWA plans to pump sufficient amounts of reuse water to the detention areas to nurture the stormwater wetlands vegetation during dry weather, no more. My recollection was that Mary Carol Edwards of the Texas A&M Coastal Watershed Program and CLCWA's technical advisor on the stormwater wetlands made this point during her public comments at the 5/29/2014. My recollection was that pumping too much water to the stormwater wetlands would be detrimental to the plants' health. Mr. Howard further asserts a possible cataclysmic flood scenario from pumping the permitted maximum through outfalls 002 and 003. I have attached photos of street flooding my wife took yesterday morning (10/06/2014) following what the Harris County Office of Homeland Security and Emergency Management website records as a less than 1.5" rainfall event. It shows flood waters above the rims on cars parked in the streets and water approaching the elevated parking lot of Clear Lake United Methodist Church (16335 El Camino Real, Houston TX 77062) less than 1/4 mile from the proposed stormwater detention project. This is the reality Clear Lake has faced, faces, and will continue to face without the CLCWA's proposed stormwater detention project, of which this permit amendment is an integral part.






STOP

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, June 17, 2014 8:07 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001
Attachments: CLCWA_20140510_Election_Results_Pie_Charts.pdf

MWD 8742 4

From: Paul.Morris@sbcglobal.net [mailto:Paul.Morris@sbcglobal.net]
Sent: Monday, June 16, 2014 10:16 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Paul Morris

E-MAIL: Paul.Morris@sbcglobal.net

COMPANY:

ADDRESS: 14922 SUN HARBOR DR
HOUSTON TX 77062-2828

PHONE: 8322214513

FAX:

COMMENTS: The purpose of the comment period is to provide TCEQ feedback on technical issues surrounding the permit that may have been overlooked in the permitting process. To the extent, if any, that TCEQ can consider the community sentiment when approving a permit application, they should consider the results of the recent (05/10/2014) Clear Lake City Water Authority (CLCWA) Board Of Director election. The

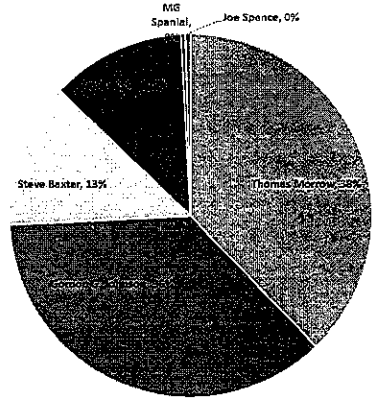
top two vote-getting candidates, Th as Morrow and Gordon Johnson, wil seated on the two open positions on the Board. Morrow and Johnson ran explicitly in favor of the Exploration Green project, of which the CLCWA permit amendment is a necessary part. Steve Baxter and Tim Daggett ran opposed to the plan. Not only did Morrow and Johnson win by wide margins, the voting pattern was consistent all voting. See attached voting analysis, both tabular for the election (bar chart) and percentages by location (pie charts). These results are posted on the CLCWA web site (http://www.clcwa.org/elections.htm). One would expect broad opposition to Exploration Green to manifest itself in fewer ballots cast for Thomas Morrow and Gordon Johnson (percent) in the Clear Lake District that includes the former golf course than in the less affected Middlebrook/Brookforest District. But the percentages are almost identical, with early voting tracking closely. Only the more distant Taylor Lake Village District, where MG Spanial has served in city government, bucked the trend.

Board of Director's Election Results - May 2014
(UNOFFICIAL)

ELECTION DAY DISTRICT REPORTING	Thomas Morrow	Gordon G. Johnson	Steve Baxter	Tim Daggett	MG Spanial	Joe Spence	Total
ABSENTEE BALLOTS CAST	42%	58%	0%	0%	0%	0%	100%
EARLY BALLOTS CAST	41%	40%	9%	8%	1%	0%	100%
DISTRICT 1 - CLEAR LAKE	38%	36%	13%	12%	0%	0%	100%
DISTRICT 2 - BROOKFOREST/MIDDLEBROOK	39%	35%	13%	12%	2%	0%	100%
DISTRICT 3 - TAYLOR LAKE VILLAGE	23%	20%	20%	5%	31%	2%	100%
TOTAL VOTES CAST	38%	36%	12%	10%	4%	0%	100%

DISTRICT 1 - CLEAR LAKE

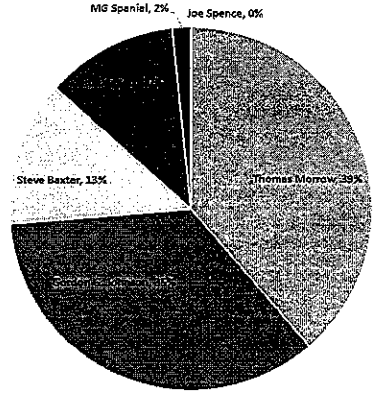
(Percentage of Total Votes Cast due to Each Voter Having Two Votes, One for Each of Two Open Positions)



Thomas Morrow Gordon G. Johnson Steve Baxter Tim Daggett MG Spanial Joe Spence

DISTRICT 2 - BROOKFOREST/MIDDLEBROOK

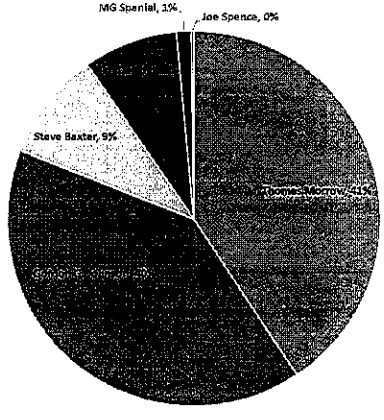
(Percentage of Total Votes Cast due to Each Voter Having Two Votes, One for Each of Two Open Positions)



Thomas Morrow Gordon G. Johnson Steve Baxter Tim Daggett MG Spanial Joe Spence

EARLY BALLOTS CAST

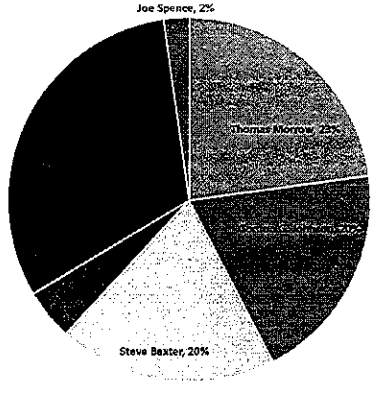
(Percentage of Total Votes Cast due to Each Voter Having Two Votes, One for Each of Two Open Positions)



Thomas Morrow Gordon G. Johnson Steve Baxter Tim Daggett MG Spanial Joe Spence

DISTRICT 3 - TAYLOR LAKE VILLAGE

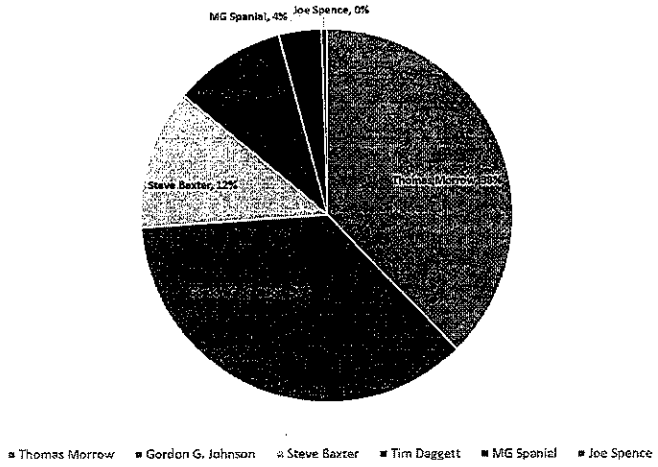
(Percentage of Total Votes Cast due to Each Voter Having Two Votes, One for Each of Two Open Positions)



Thomas Morrow Gordon G. Johnson Steve Baxter Tim Daggett MG Spanial Joe Spence

TOTAL VOTES CAST

(Percentage of Total Votes Cast due to Each Voter Having Two Votes, One for Each of Two Open Positions)



12

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: Paul Morris

Mailing Address: 14922 Sun Harbor Dr

Physical Address (if different): _____

City/State: Houston **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: Paul.Morris@sbcglobal.net ✓

Phone Number: 832-221-4513

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☒ **Please add me to the mailing list.** ✓

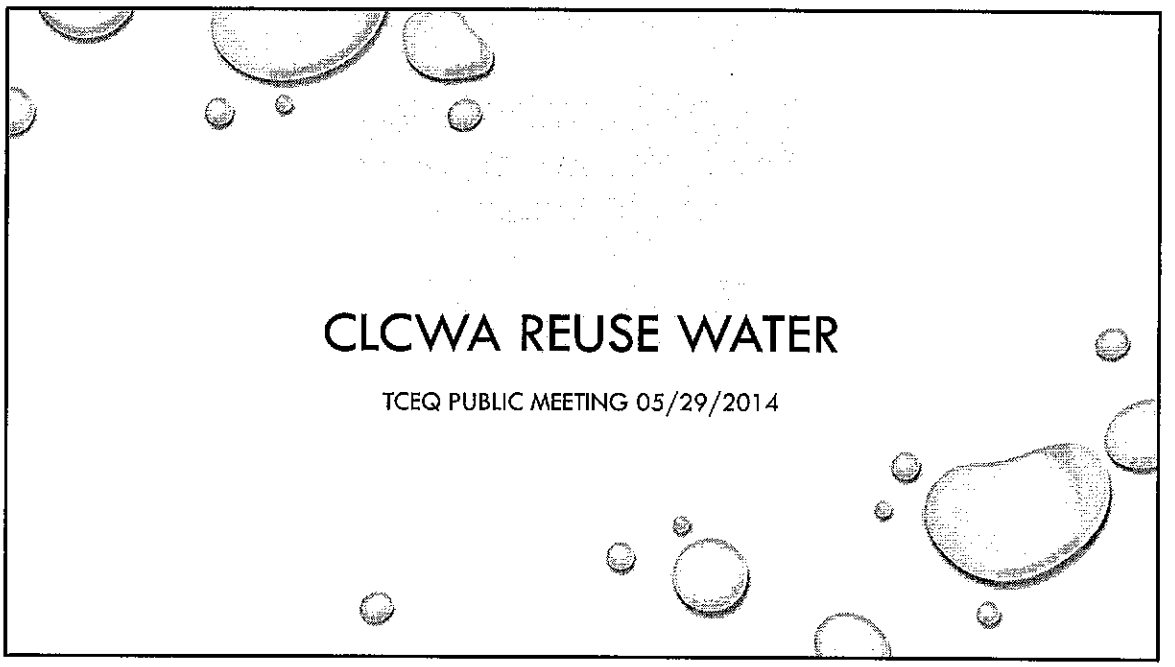
☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MW

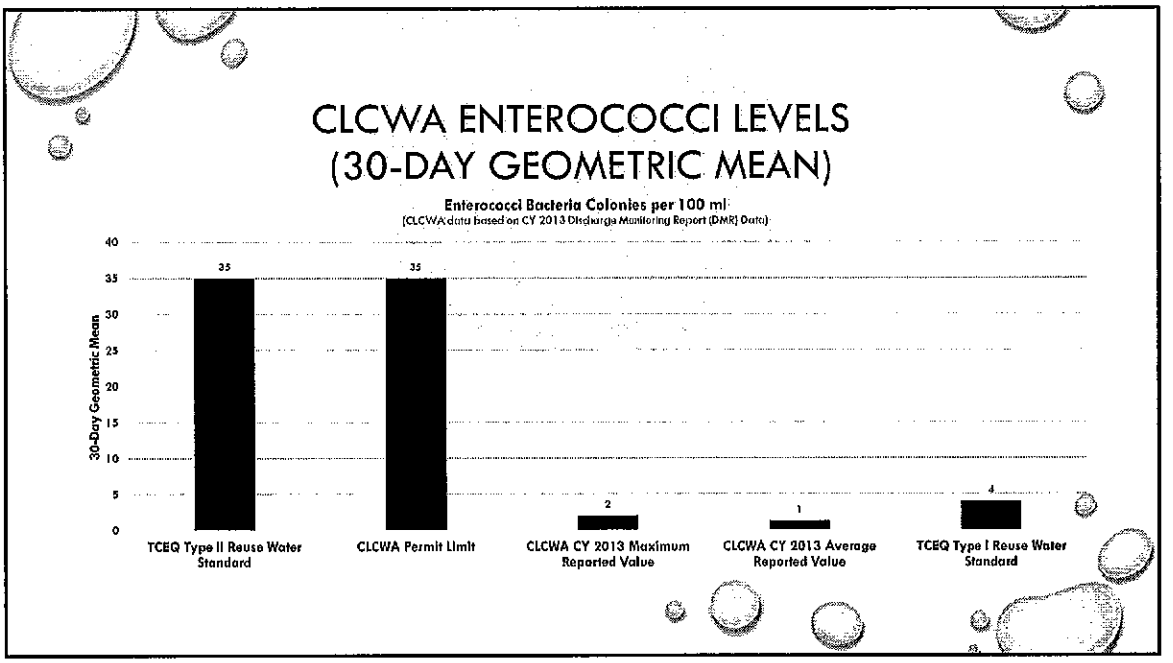


Paul J. Morris
14922 Sun Harbor Dr.
Houston TX 77062
Paul.Morris@sbcglobal.net
832-221-4513

Good evening. First I would like to thank TCEQ staff for organizing this public meeting and making the trip from Austin.

I would like to review data I have extracted from publicly available sources, either the TCEQ website or Texas Open Records Requests filed with the Clear Lake City Water Authority, to support the case for TCEQ issuing the Clear Lake City Water Authority's permit amendment.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING



A compilation of 2013 monthly Discharge Monitoring Reports (DMRs) shows the Clear Lake City Water Authority well in compliance with permit limits. The data shows for almost all parameters the CLCWA must test, the monthly averages (arithmetic mean) is between one quarter and one half the permit maximum. I have attached the spreadsheet with the data to this presentation. Bacteria seems to be the predominant concern. The current CLCWA permit *enterococci* limits are pattered after TCEQ Type II reuse water standards of 35 Colony Forming Units (CFUs) per 100 mL based on a 30-day geometric mean. The actual CLCWA 30-day geometric mean values are well below these permit limits, and compare favorably with the TCEQ Type I reuse water standards.

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MAY 29 2014
AT PUBLIC MEETING

CLCWA REUSE WATER CURRENT CUSTOMERS

- BAY OAKS COUNTRY CLUB (CONTRACTED WITH FRIENDSWOOD DEVELOPMENT) – SINCE 07/12/1990
- UNIVERSITY OF HOUSTON – CLEAR LAKE – SINCE 08/23/1991
- CLEAR LAKE GOLF CLUB (SAME PROPERTY ONTO WHICH THE PROPOSE OUTFALLS WILL BE LOCATED) – SINCE 01/11/1994 UNTIL CESSATION OF USE AS AN ACTIVE GOLF COURSE

The CLCWA has provided this water for irrigation to three primary customers without known incident since the mid-1990s, including the property onto which the proposed outfalls will discharge. I am providing copies of these contracts, acquired through a Texas Open Records Request, for reference.

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MAY 29 2014
AT PUBLIC MEETING

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

AMBIENT/RECEIVING WATER BACTERIA

COMPILED FROM TABLE 1-10: HISTORICAL WATER QUALITY DATA FOR TCEQ STATIONS FROM 2000 TO 2012, AND TABLE 2-3 WATER QUALITY MONITORING STATIONS USED FOR 303(D) LISTING DECISION

Segment Name	Assessment Unit	Station ID	Station Description	Indicator Bacteria	Geometric Mean Concentration (MPN/100 ml)	Number of Samples
Armand Bayou Tidal	1113_02	11503	Armand Bayou Tidal at Bay Area Blvd north of NASA at middle of median between 2 bridges eastern shore	EC	271.4	35
				ENT	42.8	110
Armand Bayou Above Tidal	1113A_01	11404	Armand Bayou at Genoa-Red Bluff Rd NE of Ellington AFB	EC	204.6	111
		11405	Armand Bayou at Fairmont Parkway along median at midpoint between bridges	EC	56.3	5
		17488	Armand Bayou Above Tidal 77 meters upstream of Dedman Street/West Pasadena Blvd in southeast Houston	EC	1,179.3	82
Horsepen Bayou	1113B_01	11409	Horsepen Bayou at Bay Area Blvd north of NASA	EC	205.8	37
				ENT	58.4	87
		17317	Horsepen Bayou at Middlebrook Dr. in southeast Houston	ENT	64.7	31
Unnamed Tributary to Horsepen Bayou	1113C_01	17485	Unnamed Tributary of Horsepen Bayou Tidal at Penn Hills	EC	215.1	108
Willow Springs Bayou	1113D_01	17487	Willow Spring at Bandridge Rd in southeast Houston	EC	744.0	109
Big Island Slough	1113E_01	17486	Big Island Slough at Hillridge Rd in southeast Houston	EC	608.7	105

This data was compiled from a report titled TECHNICAL SUPPORT DOCUMENT: BACTERIA TOTAL MAXIMUM DAILY LOADS FOR THE ARMAND BAYOU WATERSHED, HOUSTON, TEXAS, published in April 2014 by the TCEQ. This study was coordinated by Jason Leifester, of TCEQ's TMDL Team to assist in establishing Total Maximum Daily Loads (TMDLs) for the Armand Bayou watershed, that locally include Horsepen Bayou. I am submitting a copy of this report for reference. It contains more than 10 years compiled data on ambient bacteria in the waters of the Armand Bayou watershed.

In reviewing the maps provided in the report and comparing them to Google Maps (the shaded cells):
Station 11503 is located at Bay Area Blvd near Bay Area Park.
Station 11409 is located at Bay Area Blvd. between Clear Lake High School and Brookforest subdivision.
The "unnamed" tributary noted at Station 17485 at Penn Hills appears to be the current Harris County Flood Control ditch that runs under the Penn Hills bridge in the Oakbrook West subdivision.

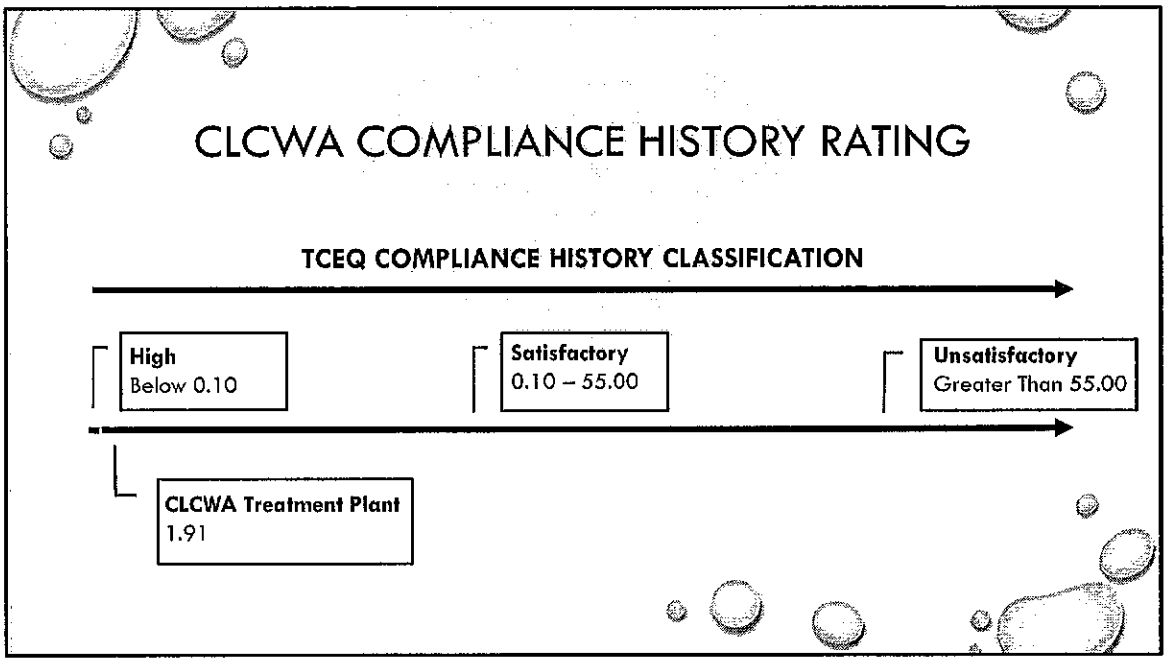
These water bodies do not receive discharge water from the CLCWA treatment plant. Yet the Most Probable Number (MPN) estimates are significantly higher for *enterococci* than the typical CLCWA treatment plant discharge, and show large quantities of *e coli* (a.k.a. fecal coliform).

The reuse water discharged from the CLCWA current outfall is far cleaner than both the receiving water into which is discharges and other local segments of the Armand Bayou Watershed

CLCWA REUSE WATER COMPARISON

- CLCWA IS WELL IN COMPLIANCE WITH PERMIT LIMITS/TCEQ TYPE II REUSE WATER STANDARD
  - CLCWA BACTERIA TYPICALLY <10% OF 30-DAY GEOMETRIC MEAN PERMIT LIMIT
- CLCWA MEETS TCEQ TYPE 1 REUSE WATER 30-DAY GEOMETRIC MEAN
- CLCWA ENTEROCOCCI LEVELS FAR LESS THAN RECEIVING WATERS AND OTHER TCEQ-MONITORED SEGMENTS OF THE ARMAND BAYOU WATERSHED

RECEIVED
MAY 29 2014
AT PUBLIC MEETING



TCEQ no doubt considers a regulated entity's compliance history when deciding whether to issue a new or amended permit. While this chart is not precisely to scale, it does show the CLCWA operates in the upper band of the "Satisfactory" range, and can be trusted to comply with permits issued by TCEQ.

Thank you for your time and consideration.

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

Clear Lake City Water Authority
Discharge Monitoring Report Data - Outfall 001-A

Month	pH		Total Suspended Solids			Ammonia Nitrogen			Total Copper			Total Zinc			Enterococci Bacteria Colonies per 100 ml		Carbonaceous Biochemical Oxygen Demand (5-day)		
	Daily Minimum	Daily Maximum	Daily Average	Daily Average	Daily Maximum	Daily Average	Daily Average	Daily Maximum	Daily Average	Daily Average	Daily Maximum	Daily Average	Daily Average	Daily Maximum	Daily Average	Daily Maximum	Daily Average	Daily Average	Daily Maximum
	6 min	9 max	1001 lbs/day	12 mg/L	40 mg/L	167 lbs/day	2 mg/L	10 mg/L	1.7 lbs/day	0.02 mg/L	0.04 mg/L	6.8 lbs/day	0.081 mg/L	0.172 mg/L	35 colonies/100 ml	89 colonies/100 ml	417 lbs/day	5 mg/L	20 mg/L
January-13	6.63	7.76	92.84	1.76	4.80	51.72	1.021	1.97	0.61	0.0114	0.019	2.66	0.054	0.073	2	60	106.47	2.12	10.6
February-13	6.66	7.99	62.14	1.47	3.20	30.40	0.687	2.52	0.33	0.0071	0.010	2.27	0.051	0.065	1	20	85.18	2.01	5.6
March-13	6.50	8.09	104.65	2.61	3.80	52.89	1.305	2.95	0.56	0.0140	0.020	2.17	0.053	0.068	2	56	125.99	3.14	7.1
April-13	6.98	7.61	175.02	3.62	21.00	55.93	1.134	3.26	0.59	0.0121	0.018	2.24	0.047	0.063	1	68	145.70	3.08	5.1
May-13	6.90	7.54	110.73	2.51	6.20	38.91	0.897	2.40	0.45	0.0107	0.013	1.63	0.038	0.045	1	32	132.24	3.01	7.3
June-13	6.79	8.30	123.10	2.76	4.20	43.74	0.996	2.87	0.52	0.0115	0.015	1.91	0.043	0.050	1	14	162.29	3.63	6.5
July-13	6.97	7.31	117.10	2.46	5.60	34.44	0.734	2.58	0.63	0.0128	0.018	2.49	0.051	0.061	1	9	155.26	3.29	6.9
August-13	6.87	7.63	91.90	2.05	4.25	25.97	0.585	1.90	0.47	0.0107	0.014	2.43	0.056	0.068	1	27	143.05	3.21	6.4
September-13	6.81	8.10	72.98	1.69	3.20	19.98	0.450	1.13	0.43	0.0100	0.012	3.11	0.075	0.210	1	10	118.37	2.74	5.4
October-13	6.90	7.51	89.79	1.75	3.75	39.42	0.863	3.00	0.56	0.0103	0.012	3.73	0.066	0.075	1	185	107.16	2.23	6.2
November-13	6.86	8.10	120.15	2.48	13.00	48.01	1.136	4.97	0.49	0.0106	0.020	3.34	0.067	0.089	2	68	112.32	2.52	6.0
December-13	7.08	7.81	74.90	1.89	3.50	58.58	1.488	3.90	0.34	0.0085	0.010	2.44	0.062	0.077	1	22	74.71	1.87	2.8
Average	6.83	7.81	102.94	2.25	6.38	41.67	0.941	2.79	0.50	0.0103	0.015	2.54	0.055	0.079	1	47	122.40	2.74	6.3
Minimum	6.50																		
Maximum		8.30	175.02	3.62	21.00	58.58	1.488	4.97	0.63	0.0140	0.020	3.73	0.075	0.210	2	185	162.29	3.63	10.6

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CLEAR LAKE CITY WATER AUTHORITY

WATER REUSE CUSTOMERS

Bay Oaks Golf Course
14545 Bay Oaks Blvd.
Houston, T.X. 77059
Terry Gill
(713) 488-7888
Estimated volume of reuse = 4,669,000 gallons per month
Acres = 105

University Of Houston
2700 Bay Area Blvd.
Houston, T.X. 77058
Ed Mackey
(713) 283-2250
Estimated volume of reuse = 753,000 gallons per month
Acres = 150

Clear Lake Golf Course
1202 Reseda
Houston, T.X. 77058
Harvey Rose
(713) 488-0240
Estimated volume of reuse = 2,103,000 gallons per month
Acres = 80

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CLEAR LAKE CITY WATER AUTHORITY
WASTEWATER RECLAMATION SYSTEM

PRESENTED AT THE ASSOCIATION OF WATER BOARD DIRECTORS

1996 SUMMER CONFERENCE

SOUTH PADRE ISLAND, TEXAS

JUNE 21, 1996

The Clear Lake City Water Authority (CLCWA) located near Clear Lake south of Houston, provides water, wastewater treatment and drainage facilities to approximately 50,000 residents, the University of Houston at Clear Lake and the Johnson Space Center (NASA). Surface Water is purchased from the City of Houston's Southeast Water Treatment Plant, in which the Water Authority owns 7.5 MGD capacity, with well water supplementing the system during periods of high usage in the summer. Water well usage is limited to 10% of the annual water consumption in accordance with the Houston-Galveston Subsidence District requirements.

In 1990, the CLCWA contracted with Friendswood Development Company, then the owner of the Bay Oaks Country Club, and with the University of Houston at Clear Lake (UHCL), to contribute 50% of the cost of wastewater reuse facilities to provide an alternate source of water for irrigation purposes.

The Water Authority has implemented a wastewater reclamation system and is currently providing irrigation water to the University of Houston at Clear Lake, the Bay Oaks Country Club and the Clear Lake Golf Club, in place of potable water which was previously used.

Work was started on the system in 1991, by installing a pumping station with a 350 g.p.m. and two 1,000 g.p.m. vertical turbine pumps mounted over the chlorination basin at the wastewater treatment facilities. Transmission lines consisting of 4,600 linear feet of 16-inch, 6,800 linear feet of 12-inch and 3,000 linear feet of 10-inch mains were installed. An additional 6,000 linear feet of distribution line was installed at the UHCL to connect to the existing sprinkler system. Cost for the system was $620,000 with Bay Oaks Country Club paying $180,000 and University of Houston at Clear Lake paying $112,000. Additional funds were provided by the Water Authority for extension to future customers. The Clear Lake Golf course extension in 1996 added approximately 7,000 linear feet of 12-inch and 3,000 linear feet of 8-inch transmission main feeding two irrigation ponds at a cost shared by the Golf Club and the Water Authority of $272,000.

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The reclaimed wastewater is of very high quality, averaging 1.5 mg/l BOD, 1.3 mg/l TSS and 1.06 mg/l NH_3H and is consistently much better than the 5-12-2 permit requirement. The Wastewater Treatment Plant expansion nearing completion, provides an average treatment capacity of 9.0 MGD, and all discharge is filtered through single-media sand filters. In addition, the total flow is exposed to ultra-violet disinfection. Stand by chlorination is available in the event of UV System failure. Plant effluent is dechlorinated if and when chlorine is used. The reclaimed water is chlorinated downstream of the pumps regardless of the method of disinfection. This is done in order to maintain residual disinfection capacity in the water while in the transmission mains. The reclaimed water distribution system is tied into the plant process water system and hydro pneumatic tank in order to maintain system pressure and minimize shocks. Blow offs are provided along the reclaimed water transmission mains to permit flushing of the mains to sanitary sewers should an odor problem occur during periods of disuse.

Operation of the system started late summer of 1992. Total usage during 1993 was 111 million gallons, 107 million gallons for Bay Oaks Country Club and four million gallons for the UHCL. This resulted in a decrease in demand on the potable water system of 3% to 5% and provided the users with an economical source of irrigation water. Attached are operating summaries showing reclaimed water usage and precipitation from start up in 1992 thru mid 1996.

The Water Authority currently contracts to provide reclaimed water at the rate of $0.10 per 1,000 gallons. This covers the cost of the pumping, chlorination and operation and is not intended to show a profit. Cost for major repairs to the system or equipment will be shared by the Water Authority and the end users on a pro rata basis.

Negotiations are underway with potential customers for additional lawn and roadway irrigation. Existing pumping facilities can provide an additional one million gallons per day. Extension to distribution lines will be required from the transmission line to new customers.

In addition to the conservation of water, the growing service area is reaching the limit of the available water in the contract with the City of Houston. Additional capacity from the City of Houston will not be available until the next Water Treatment Plant expansion due in the next five to ten years.

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CLEAR LAKE CITY WATER AUTHORITY RE-USE SUMMARY

1992

	Bay Oaks Country Club	University of Houston	Monthly Total	Precipitation
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December	417,000	451,000	866,000	4.41
Year to Date	417,000	451,000	868,000	4.41

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CLEAR LAKE CITY WATER AUTHORITY RE-USE SUMMARY

1993

	Bay Oaks Country Club	University of Houston	Monthly Total	Precipitation
January	2,690,000	320,000	3,010,000	7.28
February	14,000	67,000	81,000	2.97
* March	0	1,000	1,000	4.25
April	4,186,000	77,000	4,263,000	7.84
May	32,651,000	196,000	32,847,000	4.82
June	18,591,000	485,000	19,076,000	7.09
July	16,360,767	700,000	17,060,767	0.93
August	11,643,000	1,894,000	13,537,000	2.82
September	6,862,000	327,000	7,189,000	4.03
October	4,047,000	377,000	4,424,000	6.90
November	714,000	7,000	721,000	4.30
December	9,333,000	15,000	9,348,000	2.07
Year to Date	107,091,767	4,466,000	111,557,767	55.30

*Pumping Facilities Out of Service During March and Parts of February and April

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CLEAR LAKE CITY WATER AUTHORITY RE-USE SUMMARY

1994

	Bay Oaks Country Club	University of Houston	Monthly Total	Precipitation
January	1,462,000	25,000	1,487,000	2.55
February	439,000	31,000	470,000	1.29
March	2,283,000	37,000	2,320,000	3.07
April	3,357,000	45,000	3,402,000	5.16
May	5,883,000	146,000	6,029,000	4.90
June	6,032,000	318,000	6,350,000	5.96
July	8,525,000	952,000	9,477,000	2.34
August	5,702,000	788,000	6,490,000	6.29
September	6,465,000	389,000	6,854,000	3.97
October	4,079,000	367,000	4,446,000	13.91
November	3,520,000	293,000	3,813,000	1.79
December	766,000	371,000	1,137,000	8.77
Year to Date	48,513,000	3,762,000	52,275,000	60.00

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CLEAR LAKE CITY WATER AUTHORITY RE-USE SUMMARY

1995				
	Bay Oaks Country Club	University of Houston	Monthly Total	Precipitation
January	2,000	33,000	35,000	5.32
February	857,000	121,000	978,000	3.38
March	2,240,000	52,000	2,292,000	8.91
April	5,838,000	45,000	5,883,000	4.51
May	11,109,000	180,000	11,289,000	16.06
June	11,785,000	335,000	12,120,000	5.16
July	5,404,000	96,000	5,500,000	7.42
August	4,478,000	641,000	5,119,000	1.67
September	6,399,000	428,000	6,827,000	3.92
October	5,365,000	236,000	5,601,000	3.47
November	1,398,000	208,000	1,606,000	5.66
December	2,125,000	11,839	2,136,839	6.26
Year to Date	57,000,000	2,386,839	59,386,839	71.74

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David O. Schaffer ENGINEERS, INC.

CLEAR LAKE CITY WATER AUTHORITY RE-USE SUMMARY

1996

	Bay Oaks Country Club	University of Houston	Clear Lake Golf Course	Monthly Total	Precipitation
January	1,164,000	72,000		1,236,000	3.59
February	3,173,000	71,000	1,114,000	4,358,000	2.16
March	3,580,000	93,000	1,905,000	5,578,000	0.93
April	7,675,000	317,000	3,968,000	11,960,000	4.12
May	7,507,000	923,000	5,486,000	13,916,000	2.87
June					
July					
August					
September					
October					
November					
December					
Year to Date	23,099,000	1,476,000	12,473,000	37,048,000	13.67

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Bay Oaks Country Club

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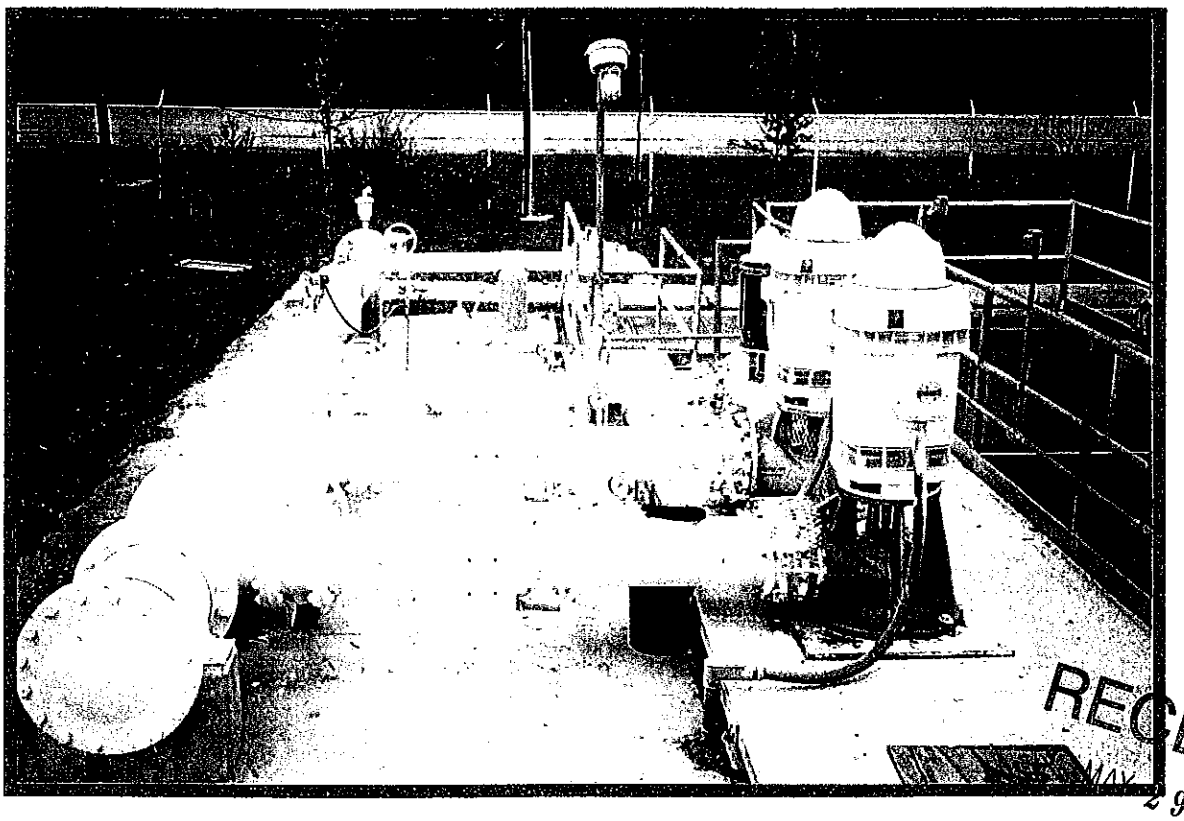
Clear Lake Golf Club

Clear Lake City Water Authority
Waste Water Treatment Plant



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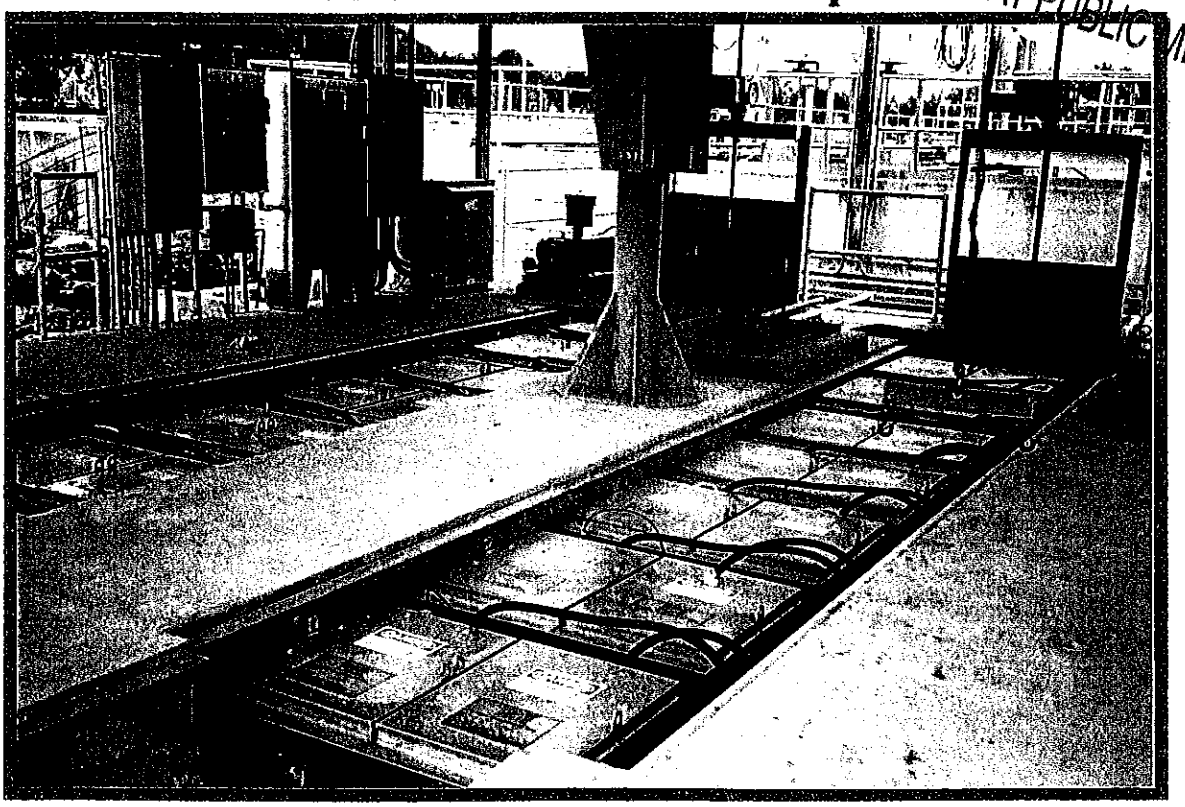
Waste Water Re-Use Pumps



Ultra-Violet Disinfection System

David G Scheffer
ENGINEERS, INC.

Original executed copy

WATER SUPPLY CONTRACT
BETWEEN
CLEAR LAKE CITY WATER AUTHORITY
AND
UNIVERSITY OF HOUSTON-CLEAR LAKE

THE STATE OF TEXAS §
§
COUNTY OF HARRIS §

This contract (the "Contract") made and entered into on the date hereinafter set forth by and between the Clear Lake City Water Authority, a political subdivision of the State of Texas created pursuant to Article 8280-280, Vernon's Texas Civil Statutes, as amended, and operating pursuant to Article 16, Section 59 of the Texas Constitution (hereinafter called "Seller"), and the University of Houston-Clear Lake, which is situated in Houston, Harris County, Texas (hereinafter called "Buyer").

W I T N E S S E T H :

WHEREAS, Seller is desirous of selling Reclaimed Water, as hereinafter defined, to Buyer and Buyer is desirous of purchasing such Reclaimed Water from Seller for purposes of landscaping irrigation;

NOW, THEREFORE, for and in consideration of the premises and the mutual convenants and agreements herein contained, the parties hereto do hereby mutually agree as follows:

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ARTICLE I.

Section 1.01. Definitions.

1. Reclaimed Water. The term "Reclaimed Water" as used herein shall mean all treated sewage effluent from Seller's wastewater treatment facility located in Pasadena, Texas, near the intersection of Space Center Blvd. and Middlebrook Drive. Reclaimed Water is to meet all applicable federal, state and local laws, ordinances and regulations for its quality and intended use for purposes of landscaping irrigation.

2. Point of Delivery. The term "Point of Delivery" as used herein shall mean that point where the Seller owned facilities for delivery of Reclaimed Water to Buyer terminate. The Point of Delivery is the connection point of the Buyer's flow measuring meter located on the south end of Bayou Drive Bridge as depicted on Exhibit ____.

3. Delivery Facilities. The term "Delivery Facilities" as used herein shall mean all pumping and metering equipment, delivery pipelines and conduits, rights-of-way, easements and all other equipment, and facilities to provide and transport Reclaimed Water.

ARTICLE II.

Section 2.01. Sale and Delivery of Water. Subject to the terms and conditions of this Contract, Seller agrees to sell and deliver (or cause to be delivered) such quantities of Reclaimed Water, at a peak rate of 1,000 gallons per minute, at the Point of Delivery provided for herein, and Buyer agrees to purchase

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such Reclaimed Water in the quantities and quality herein set forth. Unless this Contract is terminated by Seller, Buyer is obligated to pay to Seller a minimum of $500.00 per month until all of the obligations of Buyer under Section 2.03 are fulfilled, irrespective of whether there is any delivery of any reclaimed water during such month. If this Contract is terminated by Seller, Buyer has no obligation after such termination to make any payments to Seller.

Section 2.02. Rates.

1. Subject to the provision of Section 2.03 below regarding recapture of design and construction costs, all Reclaimed Water furnished by Seller to Buyer during the term of this Contract shall be in consideration of the payment of the sums set forth below:

a. Buyer agrees to reimburse Seller for Buyer's pro rata share of all direct costs of operating the Delivery Facility (the "Operating Costs"), including, electricity used therein, repair and maintenance costs; provided, however, that Buyer shall have no obligation to reimburse Seller for the cost of any effluent testing required by federal, state or local law for the normal operations of Seller's wastewater treatment facility and which testing is not the result of Seller's obligation to provide Reclaimed Water to Buyer as set forth herein. Notwithstanding anything to the contrary contained herein, Operating Costs shall be prorated among all

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buyers of Reclaimed Water from Seller, and Buyer shall be responsible only for its pro rata share of the Operating Costs.

b. In addition to reimbursing Seller its pro rata share of Operating Costs as described in Section 2.02 1(a) above, Buyer agrees to pay the sum of $0.10 per 1,000 gallons of Reclaimed Water delivered to Buyer.

2. The unit of measurement and sales unit for Reclaimed Water furnished hereunder shall be one thousand (1,000) gallons of water U.S. Standard Liquid Measure.

3. If Seller, during the term of this Contract, sells Reclaimed Water to any other users in substantially the same quantity at prices more advantageous to Buyer than those provided in this Contract, this Contract will automatically be revised to substitute the more advantageous price or prices.

Section 2.03. Initial Delivery and Combined Meter Readings.

1. Seller will proceed to design and construct the Delivery Facility to enable Buyer to receive the Reclaimed Water under this Contract. Buyer shall pay to Seller 50% (the "Buyer's Share of Construction") of all amounts owing or to be owing or paid or incurred by Seller in connection with the design, construction or inspection of the Delivery Facilities. Buyer shall have the right to review and approve prior to execution by Seller (a) all construction contracts for the construction of the Delivery Facilities; and (b) all change orders to such construction

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contracts which are in excess of $10,000 each or aggregate in excess of $20,000. Seller shall provide to Buyer monthly pay estimates approved by the engineer for the Seller. Payment of Buyer's Share of Construction, plus interest ("Interest") thereon at the rate of six percent (6%) per annum shall be made by Buyer to Seller on a monthly basis as follows:

Notwithstanding the provisions of Section 2.02 1(b) regarding a rate of $0.10 per 1,000 gallons for Reclaimed Water, Buyer agrees to pay to Seller for the purchase of Reclaimed Water the rate (the "Initial Rate") of $0.52 per 1,000 gallons, until such time as Seller has recaptured all of the Buyer's Share of Construction, plus Interest. Upon receipt of each monthly payment of the Initial Rate from Buyer, Seller shall first deduct Buyer's pro rata share of Operating Costs, with the remainder of such Initial Rate payment being applied as a credit (the "Credit") against Buyer's Share of Construction plus Interest. At such time as such Credit is equal to Buyer's Share of Construction plus Interest, the Initial Rate shall no longer be in effect, and the rate set forth in Section 2.02 1(a) plus pro rata Operating Costs as set forth in Section 2.02 1(b) shall apply.

2. Seller agrees to be responsible for the maintenance and operation of such Delivery Facility, including providing necessary permits therefor, provided Buyer is not in default under this Contract, and further provided that, except as

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otherwise provided in Section 2.02 1(a) above, Buyer shall be responsible for payment of its pro rata share of all Operating Costs incurred in connection with the maintenance and operation of the Delivery Facility.

3. There shall be no Credit for money expended in connection with Buyer's obligation to reimburse Seller a pro rata amount for Operating Costs.

4. Buyer agrees to convey to Seller, as soon as reasonably possible and without charge, such easements across Buyer's property as are needed by Seller for the purposes described herein.

Section 2.04. Measuring Equipment.

1. At Buyer's own cost and expense, Buyer shall furnish and install at or near the Point of Delivery, measuring equipment properly equipped with meters and recording devices of standard type for measuring and recording accurately the quantity of water delivered under this Contract, the meters to have a capacity for measuring the quantity of water delivered within an accuracy tolerance of five percent (5%) at current contracted quantities under the Contract; and Buyer shall also install, operate and maintain, as required, pressure regulating devices and equipment. Such measuring equipment shall be approved by Seller, and after proper installation, shall become the property of Seller.

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2. During all reasonable hours, Seller and Buyer shall have access to such measuring equipment so installed. Buyer shall have access to all records pertinent to determining the measurement and quantity of water actually delivered, but the reading of the meters for purposes of billing shall be done by Seller.

3. After proper installation thereof, Seller shall maintain the measuring equipment so installed within the said accuracy tolerance of five percent (5%) as established by periodic tests conducted at least once every twelve (12) months and shall notify Buyer at least forty-eight (48) hours in advance of the time and location at which tests are to be made. At reasonable intervals, Seller agrees to properly test said measuring equipment when requested to do so by Buyer. In addition, Buyer shall have the right to independently check said measuring equipment at any time upon notification to Seller or its authorized representative.

4. If, upon any test, the percentage of inaccuracy of any measuring equipment is found to be within the said tolerance of five percent (5%), such measuring equipment shall be deemed to have correctly measured the quantity of Reclaimed Water delivered hereunder. If, however, upon any test of the percentage of the accuracy tolerance, said tolerance is found to be in excess of five percent (5%), then such measuring equipment shall be adjusted at once to register correctly and Buyer's account shall be adjusted for a period extending back to the time when such

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inaccuracy began, if such time is ascertainable, and if such time is not ascertainable, for a period extending back one half (1/2) of the time elapsed since the date of the last test or, the date of the last adjustment to correct the registration, whichever is later, not to exceed forty-five (45) days. If, for any reason, the measuring equipment is out of service or out of repair and the amount of Reclaimed Water delivered cannot be ascertained or computed from the reading thereof, Reclaimed Water delivered during the period shall be estimated and agreed upon by the parties hereto on the basis of the best data available.

5. In the event of dispute between Seller and Buyer as to the accuracy of the testing equipment used by the Seller to conduct the test of accuracy upon the meters being used, an independent check will be mutually agreed upon between Buyer and Seller to be conducted by an independent measuring equipment company suitable to both Buyer and Seller, the cost of such test to be at Buyer's sole expense. The results of such test shall be binding on Seller and Buyer and appropriate billing adjustments will be thereby effected.

Section 2.05. Increase of Price Schedule for Reclaimed Water.

Although Seller intends that long-term contracts for the sale of Reclaimed Water should provide stable prices and although Seller believes that the present Contract price is fair and reasonable, nonetheless, the parties realize that due to unforseen contingencies, Seller may increase or decrease the price for Reclaimed Water and the initial rate described in

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Section 2.03.1. if Seller's rates for potable water are increased or decreased, such increase or decrease to be in the same proportions as that of potable water.

Section 2.06. Billing and Payment.

1. As used in this Secton 2.06, the term "day" shall mean a period of twenty-four (24) consecutive hours beginning at 8:00 o'clock a.m. on one calendar day and ending at 8:00 o'clock a.m. on the next succeeding calendar day, and the term "month" shall mean a period beginning at 8:00 o'clock a.m. on the first day of the next succeeding calendar month, except that the first month or partial month shall begin on the day of initial delivery of reclaimed water hereunder, and the monthly payment shall be prorated for such partial month, if any.

2. Each party shall read the measuring equipment at the end of each month (or at such other period of frequency arranged between the parties) at 8:00 o'clock a.m., or as near thereto as practicable.

3. Seller shall render to Buyer at Buyer's principal office at 2700 Bay Area Boulevard, Houston, Harris County, Texas 77058, on or before the fifth (5th) day of each calendar month an invoice showing the quantity of Reclaimed Water delivered hereunder by Seller, or for which payment is due hereunder, during the preceding month. Payment of such invoices shall be due and payable at 900 Bay Area Blvd., Houston, Harris County, Texas, on or before the thirtieth (30th) day after receipt of such invoice.

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4. Should Buyer fail to tender payment of any amount when due, interest hereon shall accrue at the maximum legal rate per annum from the date when due until paid.

5. In the event Buyer fails to tender payment of any amount when due and such failure continues for forty-five (45) days after notice in writing to Buyer of such default, Seller may suspend delivery of Reclaimed Water, but the exercise of such right shall be in addition to any other remedy available to Seller.

ARTICLE III.

Section 3.01. Title to and Responsibility for Water.

1. Title to, possession and control of Reclaimed Water shall remain in Seller, or its assigns, to the Point of Delivery as provided in Secton 2.01 where title to, possession and control of Reclaimed Water shall pass from Seller to Buyer, and Buyer will take such title, possession and control at such Point of Delivery.

2. The Seller shall indemnify the Buyer, its successors and assigns against, and shall hold the Buyer, its successors and assigns free and harmless from, any and all liens, claims, debts, charges, damages, losses, penalties, and expenses, liquidated or unliquidated, executed or executory, oral or written, express or implied, actual or contingent, not hereby expressly listed or described, but which may be asserted nevertheless against the Buyer, its successors or assigns, resulting from occurrences or

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omissions occurring on or before delivery of Reclaimed Water from Seller to Buyer at the Point of Delivery. Buyer shall indemnify the Seller, its successors and assigns against, and shall hold the Seller, its successors and assigns free and harmless from, any and all liens, claims, debts, charges, damages, losses, penalties, and expenses, liquidated or unliquidated, executed or executory, oral or written, express or implied, actual or contingent, not hereby expressly listed or described, but which may be asserted nevertheless against the Seller, its successors or assigns, resulting from occurrences or omissions occurring after delivery of Reclaimed Water from Seller to Buyer at the Point of Delivery. Notwithstanding anything to the contrary contained herein, in no event shall either party hereto be required to indemnify the other party for injury, death or property damage caused by such other party's own negligence.

ARTICLE IV.

Section 4.01. Term.

Unless sooner terminated as provided herein, this Contract shall be in force and effect for a period of twenty (20) years from the date of execution hereof. Upon the expiration of such twenty (20) year period, this Contract shall be automatically renewed for subsequent one (1) year periods thereafter until either party provides to the other 180 days prior written notice of intent to terminate this Contract, and terminates such Contract.

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ARTICLE V.

Section 5.01. Performance by Seller.

The parties hereto expressly covenant and agree that Seller shall have the right to contract with other users for the sale of Reclaimed Water, provided such contract does not impair Seller's ability to perform fully and punctually its obligations to Buyer under this Contract.

ARTICLE VI.

Section 6.01. Force Majeure.

1. In the event either party is rendered unable, wholly or in part, by force majeure, to carry out any of its obligations under this Contract, then the obligations of the party, to the extent it is affected by force majeure and to the extent that due diligence is being used to resume performance at the earliest practicable time, shall be suspended during the continuance of any inability so caused as to the extent provided, but for no longer period. Such cause shall, as far as possible, be remedied with all reasonable dispatch.

2. The term "force majeure", as used herein, shall include, but not be limited to, acts of God, strikes, lockouts or other industrial disturbances, acts of the public enemy, war, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, droughts, tornadoes, hurricanes, arrests and restraints of governments and people, explosions, breakage or damage to

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machinery, pipelines or canals, and any other liabilities of either party, whether similar to those enumerated or otherwise, and not within the control of the party claiming such inability, which by the exercise of due diligence and care such party could not have avoided.

ARTICLE VII.

Section 7.01. Delivery Limitations.

1. Buyer shall not be guaranteed any specific quantity, quality or pressure of water under this Contract when Seller's equipment may become inoperative due to unforseen breakdown or scheduled maintenance and repairs and Seller is in no case to be held to any liability for failure to furnish any specific amount or pressure of Reclaimed Water. Seller agrees that it will use its best efforts to maintain the Delivery Facility in good working order and will attempt to make any necessary repairs or adjustments to its equipment within reasonable times mutually agreeable to both parties, provided that Buyer shall pay to Seller the cost of such repairs or adjustments within ten (10) days from invoice. Seller shall use its best efforts to provide Reclaimed Water at a pressure sufficient to operate Buyer's sprinkler system; provided, however, Buyer acknowledges and agrees that in order to obtain such sufficient pressure from the Delivery Facility, Buyer will cooperate with other buyers of Reclaimed Water from Seller, and with Seller, to stagger usage of Reclaimed Water from the Delivery Facility. Notwithstanding any

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provision to the contrary contained herein, the rights of Buyer to purchase Reclaimed Water hereunder are subject to the rights to Reclaimed Water of (i) the Johnson Space Center, but only to the extent Johnson Space Center has rights in such Reclaimed Water; and (ii) Friendswood Development Company pursuant to that certain Water Supply Contract between Friendswood Development Company and Seller dated July 12, 1990.

2. Notwithstanding any provision to the contrary contained herein, Buyer shall have no obligation to reimburse Seller for any portion of any cost in excess of $10,000 for the repair of any one item within the Delivery Facility, unless Buyer first receives notice of the need for such repair and an opportunity to inspect.

ARTICLE VIII.

Section 8.01. Miscellaneous Provisions.

1. This Contract shall bind and benefit the respective parties and their legal successors and assigns, but shall not otherwise be assignable, in whole or in part, by either party without first obtaining written consent of the other, which consent shall not be unreasonably withheld.

2. This Contract shall be subject to all present and future valid laws, orders, rules, and regulations of the United States of America, the State of Texas, and of any regulatory body having jurisdiction. Buyer agrees to use the Reclaimed Water in a manner consistent with all Federal, state and local rules, laws or requirements.

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3. The failure of either party hereto to insist, in any one or more instances upon performance of any of the terms, covenants or conditions of this Contract, shall not be construed as a waiver or relinquishment of the future performance of any such term, covenant or condition by the other party hereto, but the obligation of such other party with respect to such future performance shall continue in full force and effect.

4. It is understood and agreed by the parties hereto that treatment standards may be changed. This Contract may be terminated by the Seller if treatment standards are made more stringent and the Seller's cost of treatment to such standards are increased, unless Buyer is agreeable to paying such difference in the cost of treatment. The Buyer may terminate the Contract if Seller treats to a less stringent standard. (See attached copy of permit.) The party desiring to terminate the Contact under the provisions of this paragraph shall give the other party 90 days notice in writing of such termination.

5. Buyer shall have the right upon written request to review and inspect during reasonable business hours the financial, operational and testing records of the Delivery Facility.

6. This instrument contains all the agreements made between the parties.

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IN WITNESS WHEREOF, the parties hereto have executed this Contract in multiple copies, each of which shall be deemed to be an original, this the 23rd day of August, 1991.

ATTEST:

Gayle L. Yoder

CLEAR LAKE CITY WATER AUTHORITY

By: Robert T. Lovell
President

ATTEST:

UNIVERSITY OF HOUSTON-CLEAR LAKE

By: A. F. Schilt
Chancellor
Alexander F. Schilt

2169W/71-86

APPROVED AS TO FORM:
8-6-91
OFFICE OF UNIVERSITY COUNSEL
UNIVERSITY OF HOUSTON SYSTEM

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WATER SUPPLY CONTRACT
BETWEEN
CLEAR LAKE CITY WATER AUTHORITY
AND
FRIENDSWOOD DEVELOPMENT COMPANY

THE STATE OF TEXAS §
§
COUNTY OF HARRIS §

This contract (the "Contract") made and entered into on the date hereinafter set forth by and between the Clear Lake City Water Authority, a political subdivision of the State of Texas created pursuant to Article 8280-280, Vernon's Texas Civil Statutes, as amended, and operating pursuant to Article 16, Section 59 of the Texas Constitution (hereinafter called "Seller"), and Friendswood Development Company, an Arizona corporation which is situated and has its principal office in Houston, Harris County, Texas (hereinafter called "Buyer").

W I T N E S S E T H :

WHEREAS, Seller is desirous of selling Reclaimed Water, as hereinafter defined, to Buyer and Buyer is desirous of purchasing such Reclaimed Water from Seller for purposes of golf course and landscaping irrigation;

NOW, THEREFORE, for and in consideration of the premises and the mutual convenants and agreements herein contained, the parties hereto do hereby mutually agree as follows:

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ARTICLE I.

Section 1.01. Definitions.

1. Reclaimed Water. The term "Reclaimed Water" as used herein shall mean all treated sewage effluent from Seller's

wastewater treatment facility located in Pasadena, Texas, near the intersection of Space Center Blvd. and Middlebrook Drive. Reclaimed Water is to meet all applicable federal, state and local laws, ordinances and regulations for its quality and intended use for purposes of golf course and landscaping irrigation.

2. Point of Delivery. The term "Point of Delivery" as used herein shall mean that point where the Seller owned facilities for delivery of Reclaimed Water to Buyer terminate. The Point of Delivery is the connection point of the Buyer's flow measuring meter located on the property known as the Bay Oaks Country Club, whose address is 14545 Bay Oaks Boulevard, Houston, Texas 77059.

3. Delivery Facilities. The term "Delivery Facilities" as used herein shall mean all pumping and metering equipment, delivery pipelines and conduits, rights-of-way, easements and all other equipment, and facilities to provide and transport Reclaimed Water to the Point of Delivery.

ARTICLE II.

Section 2.01. Sale and Delivery of Water. Subject to the terms and conditions of this Contract, Seller agrees to sell and deliver (or cause to be delivered) such quantities of Reclaimed Water, at a peak rate of 1,000 gallons per minute, at the Point of Delivery provided for herein, and Buyer agrees to purchase such Reclaimed Water in the quantities and quality herein set forth. It is anticipated Seller will produce and Buyer will

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purchase 70,000,000 gallons of Reclaimed Water per year at the Point of Delivery.

Section 2.02. Rates.

1. All Reclaimed Water furnished by Seller to Buyer during the term of this Contract shall be in consideration of the payment of the sums set forth below:

a. Buyer agrees to reimburse Seller for all direct costs of operating the Delivery Facility (the "Operating Costs"), including, but not limited to, electricity used therein, repair and maintenance costs and operation; provided, however, that Buyer shall have no obligation to reimburse Seller for the cost of any effluent testing required by federal, state or local law for the normal operations of Seller's wastewater treatment facility and which testing is not the result of Seller's obligation to provide Reclaimed Water to Buyer as set forth herein. Notwithstanding anything to the contrary contained herein, in the event Seller shall sell any Reclaimed Water to a user other than Buyer, Operating Costs shall be prorated among all buyers, and Buyer's share of the Operating Costs proportionally reduced.

b. In addition to reimbursing Seller its Operating Costs as described in Section 2.02 1(a) above, Buyer agrees to pay the sum of $0.10 per 1,000 gallons of Reclaimed Water delivered to Buyer.

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2. The unit of measurement and sales unit for Reclaimed Water furnished hereunder shall be one thousand (1,000) gallons of water U.S. Standard Liquid Measure.

3. If Seller during the term of this Contract sells Reclaimed Water to any other users in substantially the same quantity at prices more advantageous to Buyer than those provided in this Contract, this Contract will automatically be revised to substitute the more advantageous price or prices.

Section 2.03. Initial Delivery and Combined Meter Readings.

1. Seller will proceed to construct the Delivery Facility to enable Buyer to receive the Reclaimed Water under this Contract. Buyer shall pay to Seller 50% (the "Buyer's Share of Construction") of all amounts owing or to be owing or paid or incurred by Seller in connection with the design, construction or inspection of the Delivery Facilities. Buyer shall have the right to review and approve prior to execution by Seller (a) all construction contracts for the construction of the Delivery Facilities; and (b) all change orders to such construction contracts which are in excess of $10,000 each or aggregate in excess of $20,000. Such payment of Buyer's Share of Construction shall be made by Buyer to Seller within thirty (30) days of receipt of a monthly pay estimate approved by the engineer for the Seller.

2. Seller agrees to be responsible for the maintenance and operation of such Delivery Facilities, including providing necessary permits therefor, provided Buyer is not in default

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under this Contract, and further provided that, except as otherwise provided in Section 2.02 1(a) above, Buyer shall be responsible for payment of all Operating Costs incurred in connection with the maintenance and operation of the Delivery Facility.

3. An amount equal to the Buyer's Share of Construction shall be credited toward the $0.10 per 1,000 gallons charge for purchase of Reclaimed Water by Buyer and shall be applied on a monthly basis to Buyer's costs of such Reclaimed Water until such costs shall have been recaptured. Such credit shall not draw interest. There shall be no credit from construction costs against the Buyer's obligation to reimburse Seller for Operating Costs.

Section 2.04. Measuring Equipment.

1. At Buyer's own cost and expense, Buyer shall furnish and install at or near the Point of Delivery, measuring equipment properly equipped with meters and recording devices of standard type for measuring and recording accurately the quantity of water delivered under this Contract, the meters to have a capacity for measuring the quantity of water delivered within an accuracy tolerance of five percent (5%) at current contracted quantities under the Contract; and Buyer shall also install, operate and maintain, as required, pressure regulating devices and equipment. Such measuring equipment shall be approved by Seller, and after proper installation, shall become the property of Seller.

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2. During all reasonable hours, Seller and Buyer shall have access to such measuring equipment so installed. Buyer shall have access to all records pertinent to determining the measurement and quantity of water actually delivered, but the reading of the meters for purposes of billing shall be done by Seller.

3. After proper installation thereof, Seller shall maintain the measuring equipment so installed within the said accuracy tolerance of five percent (5%) as established by periodic tests conducted at least once every twelve (12) months and shall notify Buyer at least forty-eight (48) hours in advance of the time and location at which tests are to be made. At reasonable intervals, Seller agrees to properly test said measuring equipment when requested to do so by Buyer. In addition, Buyer shall have the right to independently check said measuring equipment at any time upon notification to Seller or its authorized representative.

4. If, upon any test, the percentage of inaccuracy of any measuring equipment is found to be within the said tolerance of five percent (5%), such measuring equipment shall be deemed to have correctly measured the quantity of Reclaimed Water delivered hereunder. If, however, upon any test of the percentage of the accuracy tolerance, said tolerance is found to be in excess of five percent (5%), then such measuring equipment shall be adjusted at once to register correctly and Buyer's account shall be adjusted for a period extending back to the time when such inaccuracy began, if such time is ascertainable, and if such time

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is not ascertainable, for a period extending back one half (1/2) of the time elapsed since the date of the last test or, the date of the last adjustment to correct the registration, whichever is later, not to exceed forty-five (45) days. If, for any reason, the measuring equipment is out of service or out of repair and the amount of Reclaimed Water delivered cannot be ascertained or computed from the reading thereof, Reclaimed Water delivered during the period shall be estimated and agreed upon by the parties hereto on the basis of the best data available.

5. In the event of dispute between Seller and Buyer as to the accuracy of the testing equipment used by the Seller to conduct the test of accuracy upon the meters being used, an independent check may be mutually agreed upon between Buyer and Seller to be conducted by an independent measuring equipment company suitable to both Buyer and Seller, the cost of such test to be at Buyer's sole expense.

Section 2.05. Increase of Price Schedule for Reclaimed Water.

Although Seller intends that long-term contracts for the sale of Reclaimed Water should provide stable prices and although Seller believes that the present Contract price is fair and reasonable, nonetheless, the parties realize that due to unforseen contingencies, Seller may increase or decrease the price for Reclaimed Water if Seller's rates for potable water are increased or decreased, such increase or decrease to be in the same proportions as that of potable water.

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Section 2.06. Billing and Payment.

1. As used in this Secton 2.07, the term "day" shall mean a period of twenty-four (24) consecutive hours beginning at 8:00 o'clock a.m. on one calendar day and ending at 8:00 o'clock a.m. on the next succeeding calendar day, and the term "month" shall mean a period beginning at 8:00 o'clock a.m. on the first day of the next succeeding calendar month, except that the first month or partial month shall begin on the day of initial delivery of reclaimed water hereunder, and the monthly payment shall be pro-rated for such partial month, if any.

2. Each party shall read the measuring equipment at the end of each month (or at such other period of frequency arranged between the parties) at 8:00 o'clock a.m., or as near thereto as practicable.

3. Seller shall render to Buyer at Buyer's principal office at 2400 Bay Area Blvd., Houston, Harris County, Texas, on or before the fifth (5th) day of each calendar month an invoice showing the quantity of Reclaimed Water delivered hereunder by Seller, or for which payment is due hereunder, during the preceding month. Payment of such invoices shall be due and payable at 900 Bay Area Blvd., Houston, Harris County, Texas, on or before the thirtieth (30th) day after receipt of such invoice.

4. Should Buyer fail to tender payment of any amount when due, interest hereon shall accrue at the maximum legal rate per annum from the date when due until paid.

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5. In the event Buyer fails to tender payment of any amount when due and such failure continues for forty-five (45) days after notice in writing to Buyer of such default, Seller may suspend delivery of Reclaimed Water, but the exercise of such right shall be in addition to any other remedy available to Seller.

ARTICLE III.

Section 3.01. Title to and Responsibility for Water.

1. Title to, possession and control of Reclaimed Water shall remain in Seller, or its assigns, to the Point of Delivery as provided in Secton 2.01 where title to, possession and control of Reclaimed Water shall pass from Seller to Buyer, and Buyer will take such title, possession and control at such Point of Delivery.

2. The Seller shall indemnify the Buyer, its successors and assigns against, and shall hold the Buyer, its successors and assigns free and harmless from, any and all liens, claims, debts, charges, damages, losses, penalties, and expenses, liquidated or unliquidated, executed or executory, oral or written, express or implied, actual or contingent, not hereby expressly listed or described, but which may be asserted nevertheless against the Buyer, its successors or assigns, resulting from occurrences or omissions occurring on or before delivery of Reclaimed Water from Seller to Buyer at the Point of Delivery. Buyer shall indemnify the Seller, its successors and assigns against, and shall hold the Seller, its successors and assigns free and harmless from,

any and all liens, claims, debts, charges, damages, losses, penalties, and expenses, liquidated or unliquidated, executed or executory, oral or written, express or implied, actual or contingent, not hereby expressly listed or described, but which may be asserted nevertheless against the Seller, its successors or assigns, resulting from occurrences or omissions occurring after delivery of Reclaimed Water from Seller to Buyer at the Point of Delivery. Notwithstanding anything to the contrary contained herein, in no event shall either party hereto be required to indemnify the other party for injury, death or property damage caused by such other party's own negligence.

ARTICLE IV.

Section 4.01. Term.

1. Unless sooner terminated as provided herein, this Contract shall be in force and effect for a period of twenty (20) years from the date of execution hereof. Upon the expiration of such twenty (20) year period, this Contract shall be automatically renewed for subsequent one (1) year periods thereafter until either party provides to the other 180 days prior written notice of intent to terminate this Contract, and terminates such Contract.

2. Except as set forth in Section 5.01.2. below, in the event that this Contract is terminated by either party prior to such time as Buyer receives a credit for all of Buyer's Share of Construction, Buyer shall have no right to any further

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reimbursement, payment or credit from Seller for any portion of Buyer's Share of Construction not yet recaptured by Buyer.

ARTICLE V.

Section 5.01. Performance by Seller.

1. The parties hereto expressly covenant and agree that Seller shall have the right to contract with other users for the sale of Reclaimed Water, provided such contract does not impair Seller's ability to perform fully and punctually its obligations to Buyer under this Contract.

2. In the event that Seller contracts with any user other than Buyer for the sale of Reclaimed Water from the Delivery Facility, Seller agrees to use its best efforts to obtain from such user reimbursement for such user's pro rata share of the cost of the Delivery Facility. The amount of such reimbursement allocable to Buyer's Share of Construction shall be reimbursed to Buyer within thirty (30) days from receipt.

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ARTICLE VI.

Section 6.01. Force Majeure.

1. In the event either party is rendered unable, wholly or in part, by force majeure, to carry out any of its obligations under this Contract, then the obligations of the party, to the extent it is affected by force majeure and to the extent that due diligence is being used to resume performance at the earliest practicable time, shall be suspended during the continuance of any inability so caused as to the extent provided, but for no

longer period. Such cause shall, as far as possible, be remedied with all reasonable dispatch.

2. The term "force majeure", as used herein, shall include, but not be limited to, acts of God, strikes, lockouts or other industrial disturbances, acts of the public enemy, war, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, droughts, tornadoes, hurricanes, arrests and restraints of governments and people, explosions, breakage or damage to machinery, pipelines or canals, and any other liabilities of either party, whether similar to those enumerated or otherwise, and not within the control of the party claiming such inability, which by the exercise of due diligence and care such party could not have avoided.

ARTICLE VII.

Section 7.01. Delivery Limitations.

1. Buyer shall not be guaranteed any specific quantity, quality or pressure of water under this Contract when Seller's equipment may become inoperative due to unforseen breakdown or scheduled maintenance and repairs and Seller is in no case to be held to any liability for failure to furnish any specific amount or pressure of Reclaimed Water. Seller agrees that it will use its best efforts to maintain the Delivery Facility in good working order and will attempt to make any necessary repairs or adjustments to its equipment within reasonable times mutually agreeable to both parties, provided that Buyer shall pay to

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Seller the cost of such repairs or adjustments within ten (10) days from invoice. Notwithstanding any provision to the contrary contained herein, the rights of Buyer to purchase Reclaimed Water hereunder are subject to the rights of the Johnson Space Center to such Reclaimed Water, but only to the extent Johnson Space Center has rights in such Reclaimed Water as of the date of this Contract; and further provided that Buyer's rights hereunder are superior to the rights of any persons or entities, including Johnson Space Center, who subsequently contract with Seller for the purchase of Reclaimed Water.

2. Notwithstanding any provision to the contrary contained herein, Buyer shall have no obligation to reimburse Seller for any cost in excess of $10,000 for the repair of any one item within the Delivery Facility, unless Buyer first receives notice of the need for such repair and an opportunity to inspect.

ARTICLE VIII.

Section 8.01. Miscellaneous Provisions.

1. This Contract shall bind and benefit the respective parties and their legal successors and assigns, but shall not otherwise be assignable, in whole or in part, by either party without first obtaining written consent of the other, which consent shall not be unreasonably withheld.

2. This Contract shall be subject to all present and future valid laws, orders, rules, and regulations of the United States of America, the State of Texas, and of any regulatory body having jurisdiction.

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3. The failure of either party hereto to insist, in any one or more instances upon performance of any of the terms, covenants or conditions of this Contract, shall not be construed as a waiver or relinquishment of the future performance of any such term, covenant or condition by the other party hereto, but the obligation of such other party with respect to such future performance shall continue in full force and effect.

4. It is understood and agreed by the parties hereto that treatment standards may be changed. This Contract may be terminated by the Seller if treatment standards are made more stringent and the Seller's cost of treatment to standard meeting Buyer's requirements would be higher, unless Buyer is agreeable to paying such difference in the cost of treatment. The Buyer may terminate the Contract if Seller is permitted to treat to a less stringent standard and at decreased cost to Seller. It is further agreed that the Seller shall have the right to terminate this Contract, at any time, if Seller requires the use of said Reclaimed Water to augment or increase its potable water supply. The party desiring to terminate the Contact under the provisions of this paragraph shall give the other party 90 days notice in writing of such termination.

5. Buyer shall have the right upon written request to review and inspect during reasonable business hours the financial, operational and testing records of the Delivery Facility.

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6. This instrument contains all the agreements made between the parties.

IN WITNESS WHEREOF, the parties hereto have executed this Contract in multiple copies, each of which shall be deemed to be an original, this the 12th day of July, 1990.

ATTEST:

Gayle I. Yoder

(AUTHORITY SEAL)

CLEAR LAKE CITY WATER AUTHORITY

By: Robert T. Lowery

ATTEST:

Maria Reitzug
MARIA REITZUG
2123W/44 ASST. SECRETARY

FRIENDSWOOD DEVELOPMENT COMPANY

By: T. R. Wusson
T. R. WUSSOW
VICE PRESIDENT

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WATER SUPPLY CONTRACT
BETWEEN
CLEAR LAKE CITY WATER AUTHORITY
AND
CLEAR LAKE GOLF CLUB, INC.

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STATE OF TEXAS §
§
COUNTY OF HARRIS §

This contract (the "Contract") made and entered into on the date hereinafter set forth by and between the Clear Lake City Water Authority, a political subdivision of the State of Texas created pursuant to Article 8280-280, Vernon's Texas Civil Statutes, as amended, and operating pursuant to Article 16, Section 59 of the Texas Constitution (hereinafter called "Seller"), and the Clear Lake Golf Club, Inc., a Texas corporation which is situated in Houston, Harris County, Texas (hereinafter called "Buyer").

WITNESSETH:

WHEREAS, Seller is desirous of selling Reclaimed Water, as hereinafter defined, to Buyer, and Buyer is desirous of purchasing such Reclaimed Water from Seller for purposes of golf course and landscaping irrigation;

NOW THEREFORE, for and in consideration of the premises and the mutual covenants and agreements herein contained, the parties hereto do hereby mutually agree as follows:

ARTICLE I
Definitions

1. Reclaimed Water. The term Reclaimed Water" as used herein shall mean all treated sewage effluent from Seller's wastewater treatment facility located in Pasadena, Texas, near the intersection of Space Center Boulevard and Middlebrook Drive. Reclaimed Water is to meet all applicable federal, state and local laws, ordinances and regulations for its quality and intended use for purposes of golf course and landscaping irrigation.
2. Points of Delivery. The term "Points of Delivery" as used herein shall mean those points where the Seller owned facilities for delivery of Reclaimed Water to Buyer terminate. The Points of Delivery are the connection points of the Buyer's flow measuring meter located as indicated on the attached Exhibit.
3. Delivery Facilities. The term "Delivery Facilities" as used herein shall mean all pumping and metering equipment, delivery pipelines and conduits, rights-of-way, easements and all other equipment, and facilities to provide and transport Reclaimed Water.

ARTICLE II

Section 2.01 Sale and Delivery of Water

Subject to the terms and conditions of this Contract, Seller agrees to sell and deliver (or cause to be delivered) such quantities of Reclaimed Water, at a peak rate of 1,000 gallons per minute, at the Point of Delivery provided for herein, and Buyer agrees to purchase such Reclaimed Water in the quantities and quality herein set forth. Unless this Contract is terminated by Seller, Buyer is obligated to pay to Seller a minimum of $500.00 per month until all of the obligations of Buyer under Section 2.03 are fulfilled, irrespective of whether there is any delivery of any reclaimed water during such month. If this Contract is terminated by Seller, Buyer has no obligation after such termination to make any payments to Seller.

Section 2.02 Rates

1. Subject to the provision of Section 2.03 below regarding recapture of design and construction costs, all Reclaimed Water furnished by Seller to Buyer during the term of this contract shall be in consideration of the payment of the sums set forth below:
   a. Buyer agrees to reimburse Seller for Buyer's pro rata share of all direct costs of operating the Delivery Facility (the "Operating Costs"), including electricity used therein, repair and maintenance costs; provided, however, that Buyer shall have no obligation to reimburse Seller for the cost of any effluent testing required by federal, state or local law for the normal operations of Seller's wastewater treatment facility and which testing is not the result of seller's obligation to provide Reclaimed Water to Buyer as set forth herein. Notwithstanding anything to the contrary contained herein, Operating Costs shall be prorated among all buyers of Reclaimed Water from Seller, and Buyer shall be responsible only for its pro rata share of the Operating Costs.
   b. In addition to reimbursing Seller its pro rata share of Operating Costs as described in Section 2.02.1a above, Buyer agrees to pay the sum of $0.10 per 1,000 gallons of Reclaimed Water delivered to Buyer.
2. The unit of measurement and sales unit for Reclaimed Water furnished hereunder shall be one thousand (1,000) gallons of water U.S. Standard Liquid Measure.
3. If Seller, during the term of this Contract, sells Reclaimed Water to any other users in substantially the same quantity at prices more advantageous to Buyer than those provided in this Contract, this Contract will automatically be revised to substitute the more advantageous price or prices.

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Section 2.03 Initial Delivery and Combined Meter Readings

1. Seller will proceed to design and construct the Delivery Facility to enable Buyer to receive the Reclaimed Water under this Contract. Buyer shall pay to Seller 50% (the "Buyer's Share of Construction") of all amounts owing or to be owing or paid or incurred by Seller in connection with the design, construction or inspection of the Delivery Facilities. Buyer shall have the right to review and approve prior to execution by Seller (a) all construction contracts for the construction of the Delivery Facilities; and (b) all change orders to such construction contracts which are in excess of $10,000 each or aggregate in excess of $20,000. Seller shall provide to Buyer monthly pay estimates approved by the engineer for the Seller. Payment of Buyer's Share of Construction, plus interest ("Interest") thereon at the rate of six percent (6%) per annum shall be made by Buyer to Seller on a monthly basis as follows:

   Notwithstanding the provisions of Section 2.02.1b regarding a rate of $0.10 per 1,000 gallons for Reclaimed Water, Buyer agrees to pay to Seller for the purchase of Reclaimed Water the rate (the "Initial Rate") of $1.04 per 1,000 gallons, until such time as Seller has recaptured all of the Buyer's Share of Construction, plus Interest. Upon receipt of each monthly payment of the Initial Rate from Buyer, seller shall first deduct Buyer's pro rata share of Operating costs, with the remainder of such Initial Rate payment being applied as a credit (the "Credit") against Buyer's Share of Construction plus Interest. At such time as such Credit is equal to Buyer's Share of Construction plus Interest, the Initial Rate shall no longer be in effect, and the rate set forth in Section 2.02.1a plus pro rata Operating Costs as set forth in Section 2.02.1b shall apply.

2. Seller agrees to be responsible for the maintenance and operation of such Delivery Facility, including providing necessary permits therefor, provided Buyer is not in default under this Contract, and further provided that, except as otherwise provided in Section 2.02.1a above, Buyer shall be responsible for payment of its pro rata share of all Operating costs incurred in connection with the maintenance and operation of the Delivery Facility.
3. There shall be no credit for money expended in connection with Buyer's obligation to reimburse Seller a pro rata amount for Operating costs.
4. Buyer agrees to convey to Seller, as soon as reasonably possible and without charge, such easements across Buyer's property as are needed by Seller for the purposes described herein.

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Section 2.04 Measuring Equipment

1. At Buyer's own cost and expense, Buyer shall furnish and install at or near each Point of Delivery, measuring equipment properly equipped with meters and recording devices of standard type for measuring and recording accurately the quantity of water delivered under this Contract, the meters to have a capacity for measuring the quantity of water delivered within an accuracy tolerance of five percent (5%) at current contracted quantities under the contract; and Buyer shall also install, operate and maintain, as required, pressure regulating devices and equipment. Such measuring equipment shall be approved by Seller, and after proper installation, shall become the property of Seller.
2. During all reasonable hours, Seller and Buyer shall have access to such measuring equipment so installed. Buyer shall have access to all records pertinent to determining the measurement and quantity of water actually delivered, but the reading of the meters for purposes of billing shall be done by Seller.
3. After proper installation hereof, Seller shall maintain the measuring equipment so installed within the said accuracy tolerance of five percent (5%) as established by periodic tests conducted at least once every twelve (12) months and shall notify Buyer at least forty-eight (48) hours in advance of the time and location at which tests are to be made. At reasonable intervals, Seller agrees to properly test said measuring equipment when requested to do so by Buyer. In addition, Buyer shall have the right to independently check said measuring equipment at any time upon notification to Seller or its authorized representative.
4. If, upon any test, the percentage of inaccuracy of any measuring equipment is found to be within the said tolerance of five percent (5%), such measuring equipment shall be deemed to have correctly measured the quantity of Reclaimed Water delivered hereunder. If, however, upon any test of the percentage of the accuracy tolerance, said tolerance is found to be in excess of five percent (5%), then such measuring equipment shall be adjusted at once to register correctly and Buyer's account shall be adjusted for a period extending back to the time when such inaccuracy began, if such time is ascertainable, and if such time is not ascertainable, for a period extending back one-half (1/2) of the time elapsed since the date of the last test or, the date of the last adjustment to correct the registration, whichever is later, not to exceed forty-five (45) days. If, for any reason, the measuring equipment is out of service or out of repair and the amount of Reclaimed Water delivered cannot be ascertained or computed from the reading thereof, Reclaimed Water delivered during the period shall be estimated and agreed upon by the parties hereto on the basis of the best data available.
5. In the event of dispute between Seller and Buyer as to the accuracy of the testing equipment used by the Seller to conduct the test of accuracy upon the meters being used, an independent check will be mutually agreed upon between Buyer and Seller to be

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conducted by an independent measuring equipment company suitable to both Buyer and Seller, the cost of such test to be at Buyer's sole expense. The results of such test shall be binding on Seller and Buyer and appropriate billing adjustments will be thereby effected.

Section 2.05 Increase of Price Schedule for Reclaimed Water

Although Seller intends that long-term contracts for the sale of Reclaimed Water should provide stable prices and although Seller believes that the present Contract price is fair and reasonable, nonetheless, the parties realize that due to unforeseen contingencies, Seller may increase or decrease the price for Reclaimed Water and the initial rate described in Section 2.03.1 if Seller's rates for potable water are increased or decreased, such increase or decrease to be in the same proportions as that of potable water.

Section 2.06 Billing and Payment

1. As used in this Section 2.06, the term "day" shall mean a period of twenty-four (24) consecutive hours beginning at 8:00 a.m. on one calendar day and ending at 8:00 a.m. on the next succeeding calendar day, and the term "month" shall mean a period beginning at 8:00 a.m. on the first day of the next succeeding calendar month, except that the first month or partial month shall begin on the day of initial delivery of reclaimed water hereunder, and the monthly payment shall be prorated for such partial month, if any.
2. Each party shall read the measuring equipment at the end of each month (or at such other period of frequency arranged between the parties) at 8:00 a.m., or as near thereto as practicable.
3. Seller shall render to Buyer at Buyer's principal office at 1202 Reseda, Houston, Harris County, Texas 77062, on or before the fifth (5th) day of each calendar month an invoice showing the quantity of Reclaimed Water delivered hereunder by Seller, or for which payment is due hereunder, during the preceding month. Payment of such invoices shall be due and payable at 900 Bay Area Boulevard, Houston, Harris County, Texas, on or before the thirtieth (30th) day after receipt of such invoice.
4. Should Buyer fail to tender payment of any amount when due, interest thereon shall accrue at the maximum legal rate per annum from the date when due until paid.
5. In the event Buyer fails to tender payment of any amount when due and such failure continues for forty-five (45) days after notice in writing to Buyer of such default, Seller may suspend delivery of Reclaimed Water, but the exercise of such right shall be in addition to any other remedy available to Seller.

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ARTICLE III

Title to and Responsibility for Water

1. Title to, possession and control of Reclaimed Water shall remain in Seller, or its assigns, to the Point of Delivery as provided in Section 2.01 where title to, possession and control of Reclaimed Water shall pass from Seller to Buyer, and Buyer will take such title, possession and control at such Point of Delivery.

2. The Seller shall indemnify the Buyer, its successors and assigns against, and shall hold the Buyer, its successors and assigns free and harmless from, any and all liens, claims, debts, charges, damages, losses, penalties, and expenses, liquidated or unliquidated, executed or executory, oral or written, express or implied, actual or contingent, not hereby expressly listed or described, but which may be asserted nevertheless against the Buyer, its successors or assigns, resulting from occurrences or omissions occurring on or before delivery of Reclaimed Water from seller to Buyer at the Point of Delivery. Buyer shall indemnify the Seller, its successors and assigns against, and shall hold the Seller, its successors and assigns free and harmless from, any and all liens, claims, debts, charges, damages, losses, penalties, and expenses, liquidated or unliquidated, executed or executory, oral or written, express or implied, actual or contingent, not hereby expressly listed or described, but which may be asserted nevertheless against the Seller, its successors or assigns, resulting from occurrences or omissions occurring after delivery of Reclaimed Water from Seller to Buyer at the Point of Delivery. Notwithstanding anything to the contrary contained herein, in no event shall either party hereto be required to indemnify the other party for injury, death or property damage caused by such other party's own negligence.

ARTICLE IV

Term

Unless sooner terminated as provided herein, this Contract shall be in force and effect for a period of twenty (20) years from the date of execution hereof. Upon the expiration of such twenty (20) year period, this Contract shall be automatically renewed for subsequent one (1) year periods thereafter until either party provides to the other 180 days prior written notice of intent to terminate this Contract, and terminates such Contract.

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ARTICLE V

Performance by Seller

The parties hereto expressly covenant and agree that Seller shall have the right to contract with other users for the sale of Reclaimed Water, provided such contract does not impair Seller's ability to perform fully and punctually its obligations to Buyer under this Contract.

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ARTICLE VI

Force Majeure

1. In the event either party is rendered unable, wholly or in part, by *force majeure*, to carry out any of its obligations under this Contract, then the obligations of the party, to the extent it is affected by *force majeure* and to the extent that due diligence is being used to resume performance at the earliest practicable time, shall be suspended during the continuance of any inability so caused as to the extent provided, but for no longer period. Such cause shall, as far as possible, be remedied with all reasonable dispatch.
2. The term "*force majeure*", as used herein, shall include, but not be limited to, acts of God, strikes, lockouts or other industrial disturbances, acts of the public enemy, war, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, droughts, tornadoes, hurricanes, arrests and restraints of governments and people, explosions, breakage or damage to machinery, pipelines or canals, and any other liabilities of either party, whether similar to those enumerated or otherwise, and not within the control of the party claiming such inability, which by the exercise of due diligence and care such party could not have avoided.

ARTICLE VII

Delivery Limitations

1. Buyer shall not be guaranteed any specific quantity, quality or pressure of water under this Contract when Seller's equipment may become inoperative due to unforeseen breakdown or scheduled maintenance and repairs, and Seller is in no case to be held to any liability for failure to furnish any specific amount or pressure of Reclaimed Water. Seller agrees that it will use its best efforts to maintain the Delivery Facility in good working order and will attempt to make any necessary repairs or adjustments to its equipment within reasonable times mutually agreeable to both parties, provided that Buyer shall pay to Seller the cost of such repairs or adjustments within ten (10) days from invoice. Seller shall use its best efforts to provide Reclaimed Water at a rate of flow sufficient to operate Buyer's sprinkler system; provided, however, Buyer acknowledges and agrees that in order to obtain such sufficient flows from the Delivery Facility, Buyer will cooperate with other buyers of Reclaimed Water from Seller, and

with Seller, to stagger usage of Reclaimed Water from the Delivery Facility. Notwithstanding any provision to the contrary contained herein, the rights of Buyer to purchase Reclaimed Water hereunder are subject to the rights to Reclaimed Water of (i) the Johnson Space Center, but only to the extent Johnson Space Center has rights in such Reclaimed Water; (ii) Friendswood Development Company pursuant to that certain Water Supply Contract between Friendswood Development Company and Seller dated July 12, 1990; and (iii) University of Houston-Clear Lake pursuant to that certain Water Supply Contract between University of Houston-Clear Lake and Seller dated August 23, 1991.

2. Notwithstanding any provision to the contrary contained herein, Buyer shall have no obligation to reimburse Seller for any portion of any cost in excess of $10,000 for the repair of any one item within the Delivery Facility, unless Buyer first receives notice of the need for such repair and an opportunity to inspect.

ARTICLE VIII
Miscellaneous Provisions

1. This Contract shall bind and benefit the respective parties and their legal successors and assigns, but shall not otherwise be assignable, in whole or in part, by either party without first obtaining written consent of the other, which consent shall not be unreasonably withheld.
2. This Contract shall be subject to all present and future valid laws, orders, rules and regulations of the United States of America, the State of Texas, and of any regulatory body having jurisdiction. Buyer agrees to use the Reclaimed Water in a manner consistent with all federal, state and local rules, laws or requirements.
3. The failure of either party hereto to insist, in any one or more instances upon performance of any of the terms, covenants or conditions of this Contract, shall not be construed as a waiver or relinquishment of the future performance of any such term, covenant or condition by the other party hereto, but the obligation of such other party with respect to such future performance shall continue in full force and effect.
4. Any event which results in default shall have the following cure periods:
   (a) Failure to pay any monetary sum due: ten (10) days written notice from non-defaulting party to the defaulting party;
   (b) Failure in the performance or observance of any of the obligations, duties, covenants, warranties or representations: thirty (30) days written notice, specifying in detail the nature of such failure; provided, however, in the event that such failure cannot after a good faith effort and with due diligence be cured within such 30 day period, the time within which the defaulting party shall be allowed to cure such failure shall be extended for such period not to exceed sixty (60) days as may be necessary to complete the same with due diligence, from the

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non-defaulting party to the defaulting party. The non-defaulting party is not obligated to make any payments to the defaulting party during any cure period, and the non-defaulting party's payment obligations terminate at such time as the defaulting party fails to cure its default within the time period provided.

5. All notices to be provided under the Contract shall be provided to Buyer at both the following addresses: 1202 Reseda, Houston, Texas 77062 and P.O. Box 819012, Dallas, Texas 75381-9012, Attn: General Counsel, and to Seller at 900 Bay Area Boulevard, Houston, Texas 77058, Attn: General Manager.

6. Seller recognizes and acknowledges that Buyer is an independent corporation, chartered under the laws of Texas where Buyer operates its business, to whom Seller will solely look and who is solely responsible for the obligations and liabilities of Buyer recited herein, arising hereunder, or in any manner related to the transactions contemplated hereby. Seller further recognizes and acknowledges that no other entity or entities, including (i) Buyer's parent corporation, (ii) any individual, or (iii) any corporation affiliated with Buyer, is in any manner liable or responsible for the obligations and liabilities of Buyer, whether recited herein, arising hereunder, or in any manner related to the transactions contemplated hereby. Seller is thus solely relying on the financial ability of Buyer.

7. It is understood and agreed by the parties hereto that treatment standards may be changed. This Contract may be terminated by the Seller if treatment standards are made more stringent and the Seller's cost of treatment to such standards are increased, unless Buyer is agreeable to paying such difference in the cost of treatment. The Buyer may terminate the Contract if Seller treats to a less stringent standard. (See attached copy of permit.) The party desiring to terminate the Contract under the provisions of this paragraph shall give the other party 90 days notice in writing of such termination.

8. Buyer shall have the right upon written request to review and inspect during reasonable business hours the financial, operational and testing records of the Delivery Facility.

9. This instrument contains all the agreements made between the parties.

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IN WITNESS WHEREOF, the parties hereto have executed this contract in multiple copies, each of which shall be deemed to be an original, this the 11th day of January, 1994.

CLEAR LAKE CITY WATER AUTHORITY

ATTEST:

Gayle I. Yoder, *Secretary*

Robert T. Savely, *President*

(AUTHORITY SEAL)

CLEAR LAKE CITY GOLF CLUB, INC.

ATTEST:

_____
Secretary

V.P.
[Title]

CLCWA.GEN\WATERSUP.CON

TECHNICAL SUPPORT DOCUMENT: BACTERIA TOTAL MAXIMUM DAILY LOADS FOR THE ARMAND BAYOU WATERSHED, HOUSTON, TEXAS (1113_02, 1113A_01, 1113B_01, 1113C_01, 1113D_01 AND 1113E_01)

(photo courtesy of Armand Bayou Nature Center)

http://www.abnc.org/index.php?mact=PicasaWebAlbumBrowser,cntnt01,default,0&cntnt01user=armandbayou%40gmail.com&cntnt01albumid=5342408988796246913&cntnt01imagethumbsize=144&cntnt01albumthumbsize=&cntnt01imagesize=720&cntnt01include=ABNC&cntnt01exclude=&cntnt01returnid=24

Prepared for:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

TCEQ

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Prepared by:

University of Houston

CDM Smith

APRIL 2014

TECHNICAL SUPPORT DOCUMENT: BACTERIA TOTAL MAXIMUM DAILY LOADS FOR THE ARMAND BAYOU WATERSHED, HOUSTON, TEXAS

(1113_02, 1113A_01, 1113B_01, 1113C_01, 1113D_01 AND 1113E_01)

Contract No. 582-10-90494
Work Order No. 582-10-90494-24

Prepared for:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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APRIL 2014

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ACRONYMS AND ABBREVIATIONS

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ASAE	American Society of Agricultural Engineers
C-CAP	Coastal Change Analysis Program
CAFO	concentrated animal feeding operation
CFR	Code of Federal Regulations
cfs	cubic feet per second
counts	colony forming unit
CN	curve number
dL	deciliter
DMR	discharge monitoring report
E coli	Escherichia coli
FDC	flow duration curve
GCHD	Galveston County Health District
GIS	geographic information system
HCFCD	Harris County Flood Control District
HCOEM	Harris County Office of Emergency Management
H-GAC	Houston-Galveston Area Council
LA	load allocation
LDC	load duration curve
mL	milliliter
MOS	margin of safety
MS4	municipal separate storm sewer system
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRCS	National Resources Conservation Service
OSSF	on-site sewage facility
RMSE	root mean square error
SSO	sanitary sewer overflow
SWQS	surface water quality standards
SWQMIS	Surface Water Quality Monitoring Information System
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TCOON	Texas Coastal Ocean Observation Network
TMDL	Total Maximum Daily Loads
TPDES	Texas Pollution Discharge Elimination System
TSARP	Tropical Storm Allison Recovery Project
TWDB	Texas Water Development Board

USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WLA	waste load allocation
WQM	water quality monitoring
WQS	water quality standard
WWTF	wastewater treatment facility

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CHAPTER 1
INTRODUCTION

1.1 Watershed Description

The Armand Bayou Watershed encompasses approximately 60 square miles of land located just southeast of the City of Houston, Texas and lies entirely within Harris County. The Armand Bayou Watershed is part of the San Jacinto-Brazos Coastal Basin, which covers the coastal portions of Galveston, Harris and Brazoria counties located between the San Jacinto River and the Brazos River. Armand Bayou is one of the major tributaries within this basin along with Clear Creek, Dickinson Bayou, Chocolate Bayou, Bastrop Bayou and Oyster Creek. Armand Bayou flows into Clear Lake (Segment 2425) which, in turn, feeds into Upper Galveston Bay (Segment 2421) which eventually discharges to the Gulf of Mexico (Segment 2501).

Armand Bayou lies wholly within the Northern Humid Gulf Coastal Prairies ecoregion, characterized by original vegetation consisting of "grasslands with a few clusters of oaks, known as oak mottes or maritime woodlands." As noted by Griffith et al. (2007), "almost all of the coastal prairies have been converted to cropland, rangeland, pasture or urban land uses" and the Armand Bayou watershed is no different: the northern and southwestern portions of the watershed are heavily developed while the lower and middle regions are sparsely developed. Within the lower region of the watershed, Armand Bayou Nature Center owns and manages 2500 acres as part of a wildlife and nature preserve. The watershed is expected to continue to develop based on its proximity to the Johnson Space Center, Houston Ship Channel, and Clear Lake.

Armand Bayou and its tributaries have both freshwater segments and tidally influenced mixed segments. The Texas Commission on Environmental Quality (TCEQ) classifies Armand Bayou as two separate waterbodies:

- Armand Bayou Tidal, Segment 1113 and
- Armand Bayou Above Tidal, Segment 1113A.

In addition, there are several tributaries to Armand Bayou that are unclassified but have been assigned assessment unit identification numbers by the TCEQ. Horsepen Bayou Tidal (1113B_01), Unnamed Tributary to Horsepen Bayou (1113C_01), and Big Island Slough (1113E_01) are tributaries to Armand Bayou Tidal. Willow Springs Bayou (1113D_01) is a tributary to Armand Bayou Above Tidal and is a freshwater stream.

Subwatershed List

This report focuses on the following waterbodies that TCEQ placed in Category 5[1303(d) list] of the Draft 2012 Integrated Report for nonsupport of contact recreation use:

- Armand Bayou Tidal (1113_02)
- Armand Bayou Above Tidal (1113A_01)
- Horsepen Bayou Tidal (1113B_01)
- Unnamed Tributary to Horsepen Bayou (1113C_01)

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- Willow Springs Bayou (1113D_01)
- Big Island Slough (1113E_01)

Figure 1-1 is a location map showing these Texas waterbodies and their contributing watersheds. The delineation of each subwatershed is derived from 2005 geographic information system (GIS) data files created for the Tropical Storm Allison Recovery Project (TSARP) provided by Harris County Flood Control District (HCFCD). These waterbodies and their surrounding watersheds are hereinafter referred to as the Study Area.

The climate of the region is subtropical humid, with very hot and humid summers and mild winters. The average maximum daytime temperature is 34 degrees Celsius (93 degrees Fahrenheit) while the temperature averages between 4 and 16 degrees Celsius (39 to 61 degrees Fahrenheit) during the winter. Summer rainfall is dominated by sub-tropical convection, winter rainfall by frontal storms, and fall and spring months by combinations of these two (Burian 2005).

Table 1-1, derived from the 2000 and 2010 U.S. Census, demonstrates that the county in which the watershed is located is very densely populated. Table 1-1 also shows population growth for Harris County (U.S. Census Bureau 2010).

Table 1-1: County Population and Density

County Name	2000 U.S. Census	2000 Population Density (per square mile)	2010 U.S. Census	2010 Population Density (per square mile)
Harris	3,400,578	1,967	4,092,459	2,367

Source: U.S. Census 2000 and 2010

The six largest cities within Armand Bayou Watershed are expected to increase in population by an average of 16 percent from 2010 to 2030, according to the Texas Water Development Board (TWDB) (TWDB 2013). Table 1-2 lists TWDB population growth estimates for these six cities from 2010 to 2030. City of Houston is the largest City in the watershed and is anticipated to grow by 16% while Taylor Lake Village is the smallest city and is anticipated to grow a small amount, just 2% between 2010 and 2030.

Table 1-2: Armand Bayou Watershed Population Increases by City, 2010 to 2030

City	2010 Census Population	2020 Population Estimate	2030 Population Estimate	Growth Rate (2010-2030)
Deer Park	32,010	34,255	35,974	12%
Houston	2,058,056	2,201,986	2,377,662	16%
La Porte	33,800	34,345	34,774	3%
Pasadena	149,043	154,441	158,841	7%
Taylor Lake Village*	3,544	3,557	3,618	2%
Webster	10,400	15,071	16,187	56%

Source: Region H - Draft Population and Municipal Demand Projections for 2016 Regional and 2017 State Water Plan, http://www.twdb.state.tx.us/waterplanning/data/projections/2017/demandproj.asp

Population estimates for each Assessment Unit drainage area were derived from the 2010 Census and are provided in Table 1-3.

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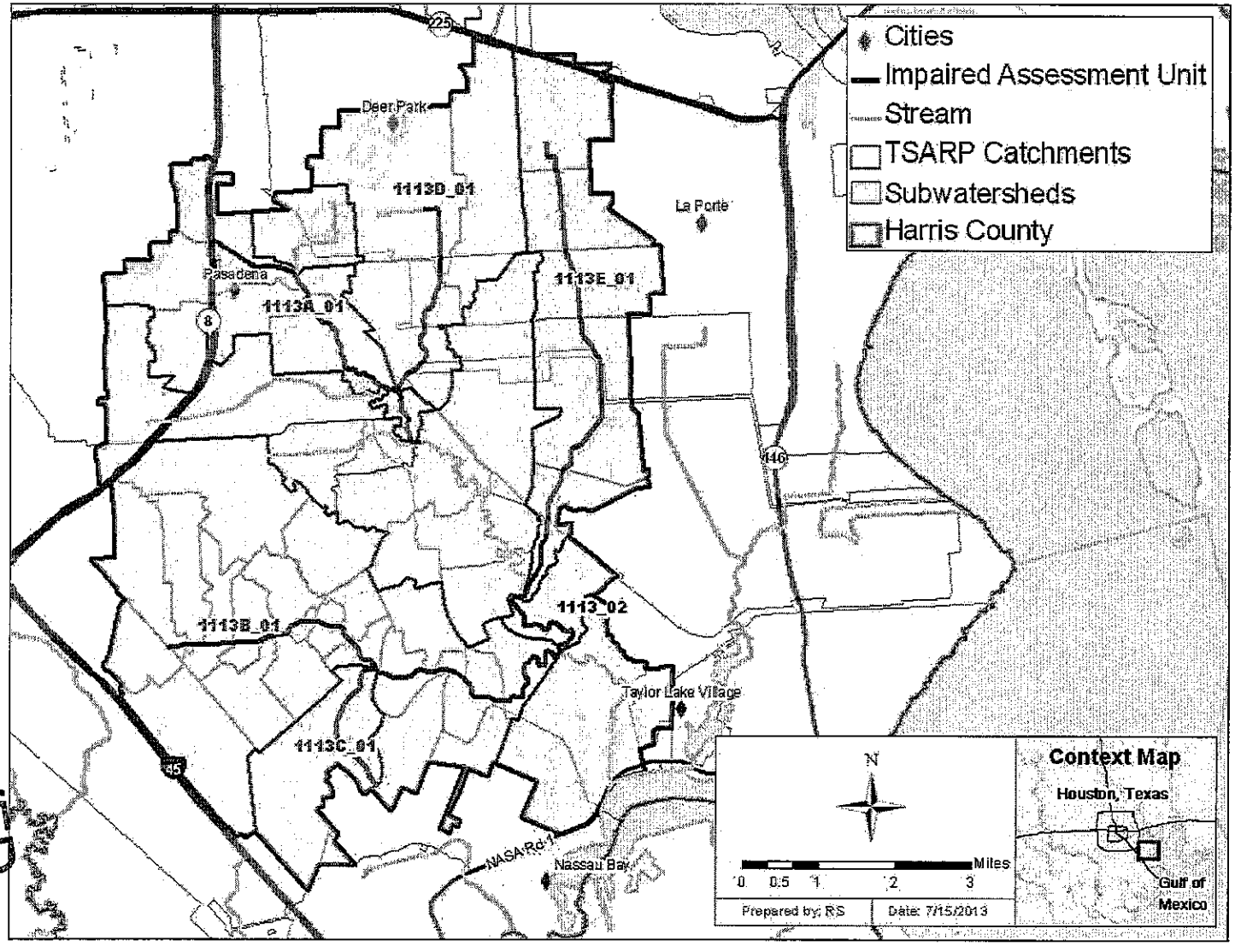

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Figure 1-1: Location Map for Armand Bayou Watershed

Table 1-3: Population estimate by Assessment Unit

Segment Name	Assessment Unit	2010 Census Population Estimate	2010 Census Household Count
Armand Bayou Tidal	1113_02	294	207
Armand Bayou Above Tidal	1113A_01	14,376	5,277
Horsepen Bayou Tidal	1113B_01	27,494	11,076
Unnamed Tributary to Horsepen Bayou	1113C_01	17,680	8,041
Willow Springs Bayou	1113D_01	21,921	8,163
Big Island Slough	1113E_01	14,782	5,177

1.2 Summary of Existing Data

The following subsections summarize existing data relevant to soil, land cover, and precipitation throughout the watershed as well as the chemical and physical characteristics of the waterbodies using ambient water quality, stream flow, tide, and conductivity data.

1.2.1 Soil

The geology of the Armand Bayou Watershed is comprised of moderately to very clayey soils which combined with the flat topography in the area, results in the large amount of natural wetlands in the area (Coastal Coordination Council, 2006). The soil has a low water-bearing capacity, high moisture content, low permeability, and a high shrink-swell potential. The Soil Survey Geographic (SSURGO) Database National Resources Conservation Service (NRCS) 2012 information was used to characterize soil in the Study Area. As shown in Figure 1-2, the soil types that dominate the watershed are the Atasco, Beaumont, Bernard, and Gessner soil series. Table-1-3 lists the attributes of the soil series found in the Study Area; Table 1-4 provides the soil distribution in the Study Area.

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Table 1-4: Characteristics of Soil Types of Armand Bayou Watershed

NRCS Soil Type	Surface Texture	Soil Series Name	Hydro-logic Soil Group	Soil Drainage Class	Average Available Water Storage (cm)
TX201	Loam	Addicks loam	B/D	Poorly Drained	30.0
TX201	Loam	Addicks-Urban land complex	B/D	Poorly Drained	30.0
TX201	Very Fine Sandy Loam	Aldine very fine sandy loam	D	Somewhat Poorly Drained	26.5
TX201	Very Fine Sandy Loam	Aldine-Urban land complex	D	Somewhat Poorly Drained	26.5
TX201	Fine Sandy Loam	Aris fine sandy loam	C	Poorly Drained	21.4
TX201	Fine Sandy Loam	Atasco fine sandy loam, 1 to 4 percent slopes	D	Moderately Well Drained	27.1
TX201	Clay	Beaumont clay	D	Poorly Drained	22.5
TX201	Clay Loam	Bernard clay loam	D	Somewhat Poorly Drained	24.9
TX201	Clay Loam	Bernard-Edna complex	D	Somewhat Poorly Drained	23.9
TX201	Clay Loam	Bernard-Urban land complex	D	Somewhat Poorly Drained	24.9
TX201	Loam	Gessner loam	B/D	Poorly Drained	25.0
TX201	Clay	Ijam soils	D	Poorly Drained	16.5
TX201	Clay	Lake Charles clay, 0 to 1 percent slopes	D	Moderately Well Drained	27.0
TX201	Clay	Lake Charles-Urban land complex	D	Moderately Well Drained	27.0
TX201	Silty Clay Loam	Verland silty clay loam	D	Somewhat Poorly Drained	27.2
TX201	Silty Clay Loam	Verland-Urban land complex	D	Somewhat Poorly Drained	27.2
TX201	Loam	Nahatche loam	B/D	Somewhat Poorly Drained	23.4
TX201	n/a	Urban land	D	n/a	0.0
TX201	Clay	Vamont clay, 0 to 1 percent slopes	D	Somewhat Poorly Drained	27.0
TX201	Clay	Vamont clay, 1 to 4 percent slopes	D	Somewhat Poorly Drained	27.0

All information derived from SSURGO data: http://datagateway.nrcs.usda.gov/
http://soils.usda.gov/survey/online_surveys/texas/harrisTX1976/harris.pdf

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Table 1-5: Soil Type Distribution in Armand Bayou Watershed

	Assessment Unit					
Soil Series Name	1113_02	1113A_01	1113B_01	1113C_01	1113D_01	1113E_01
Addicks loam	0%	14%	6%	0%	3%	0%
Addicks-Urban land complex	0%	16%	2%	0%	4%	0%
Aldine very fine sandy loam	0%	0%	0%	0%	0%	0%
Aldine-Urban land complex	6%	0%	1%	0%	0%	0%
Aris fine sandy loam	21%	0%	1%	0%	0%	30%
Atasco fine sandy loam, 1 to 4 percent slopes	0%	20%	16%	25%	15%	0%
Beaumont clay	0%	0%	5%	1%	35%	27%
Bernard clay loam	0%	10%	8%	2%	11%	1%
Bernard-Edna complex	0%	0%	0%	10%	0%	0%
Bernard-Urban land complex	0%	34%	43%	27%	27%	22%
Gessner loam	0%	6%	15%	34%	0%	5%
Ijam soils	52%	0%	1%	0%	5%	1%
Lake Charles clay, 0 to 1 percent slopes	3%	0%	0%	0%	0%	0%
Lake Charles-Urban land complex	0%	0%	0%	0%	0%	0%
Verland silty clay loam	6%	0%	0%	0%	0%	11%
Verland-Urban land complex	4%	0%	2%	1%	0%	3%
Nahatche loam	8%	0%	0%	0%	0%	0%

All information derived from SSURGO data: http://datagateway.nrcs.usda.gov/

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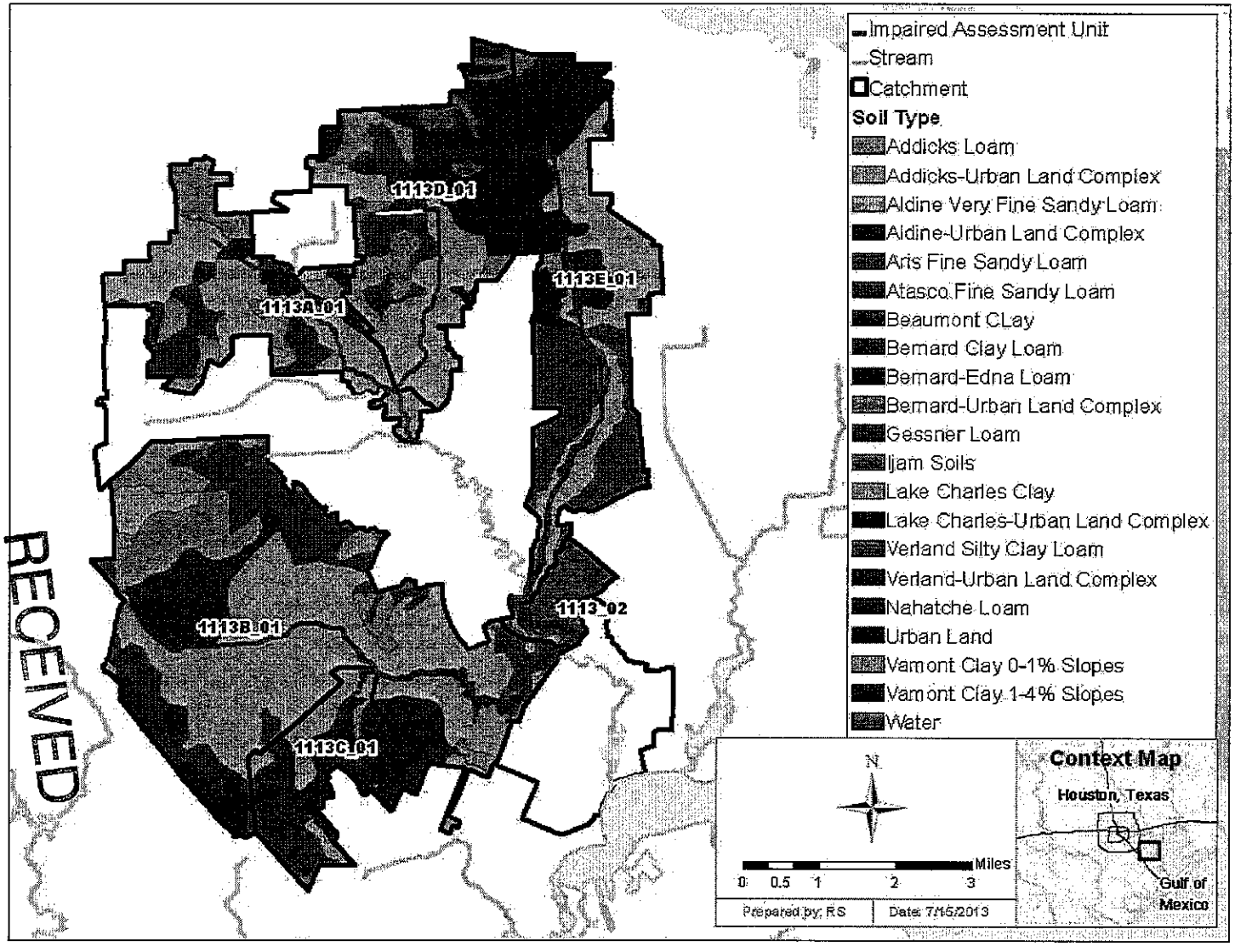

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Figure 1-2: Armand Bayou Region Soil Types

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1.2.2 Land Cover

As previously noted, the northern and southwestern portions of the Armand Bayou watershed are heavily developed while the lower and middle regions are sparsely developed. Table 1-5 summarizes the acreages and the corresponding percentages of the land cover categories for the contributing subwatershed associated with each impaired assessment unit in the Armand Bayou Watershed. The land cover data were retrieved from the National Oceanic and Atmospheric Administration (2011) land cover database obtained from Houston-Galveston Area Council. The total acreage of each segment in Table 1-5 corresponds to the watershed delineation in Figure 1-3. The predominant land cover category in this watershed is developed land (between 9% and 99%), followed by woody wetlands (between 0% and 66%) and hay/pasture (between 0% and 11%). Open water and bare/transitional land account for less than 10 percent of the assessment units.

Table 1-6: Aggregated Land Cover Summaries by Assessment Unit

Aggregated Land Cover Category	Segment Name and Assessment Unit ID					
	Armand Bayou Tidal	Armand Bayou Above Tidal	Horsepen Bayou Tidal	Unnamed Tributary to Horsepen Bayou	Willow Springs Bayou	Big Island Slough
Assessment Unit	1113_02	1113A_01	1113B_01	1113C_01	1113D_01	1113E_01
Acres of Open Water	68	41	117	0	38	61
Acres of Developed, Open Space	27	631	2,978	215	1,089	869
Acres of Developed, Low Intensity	11	809	1,343	327	783	745
Acres of Developed, Medium Intensity	10	1,178	2,534	1,032	1,607	1,293
Acres of Developed, High Intensity	12	511	679	190	392	483
Acres of Barren Land	15	10	33	0	25	32
Acres of Deciduous Forest	9	50	312	7	32	81
Acres of Evergreen Forest	29	1	22	0	15	20
Acres of Mixed Forest	3	3	11	0	2	44
Acres of Shrub/Scrub	2	39	344	0	55	47
Acres of Herbaceous	22	96	489	5	286	313
Acres of Hay/Pasture	0	162	1,143	0	511	271
Acres of Cultivated Crops	0	5	0	0	1	1
Acres of Woody Wetlands	443	152	662	0	34	842
Acres of Emergent Herbaceous Wetlands	22	0	0	0	0	3

Aggregated Land Cover Category	Segment Name and Assessment Unit ID					
	Armand Bayou Tidal	Armand Bayou Above Tidal	Horsepen Bayou Tidal	Unnamed Tributary to Horsepen Bayou	Willow Springs Bayou	Big Island Slough
Assessment Unit	**1113_02**	**1113A_01**	**1113B_01**	**1113C_01**	**1113D_01**	**1113E_01**
Watershed Area (acres)	**673**	**3,688**	**10,667**	**1,776**	**4,870**	**5,105**
Percent Open Water	10%	1%	1%	0%	1%	1%
Percent Developed, Open Space	4%	17%	28%	12%	22%	17%
Percent Developed, Low Intensity	2%	22%	13%	19%	16%	15%
Percent Developed, Medium Intensity	2%	32%	24%	58%	33%	25%
Percent Developed, High Intensity	2%	14%	6%	11%	8%	10%
Percent Barren Land	2%	0%	0%	0%	1%	1%
Percent Deciduous Forest	1%	1%	3%	0%	1%	2%
Percent Evergreen Forest	4%	0%	0%	0%	0%	0%
Percent Mixed Forest	1%	0%	0%	0%	0%	1%
Percent Shrub/Scrub	0%	1%	3%	0%	1%	1%
Percent Herbaceous	3%	3%	5%	0%	6%	6%
Percent Hay/Pasture	0%	5%	11%	0%	10%	5%
Acres of Cultivated Crops	0%	0%	0%	0%	0%	0%
Percent Woody Wetlands	66%	4%	6%	0%	1%	16%
Percent Emergent Herbaceous Wetlands	3%	0%	0%	0%	0%	0%

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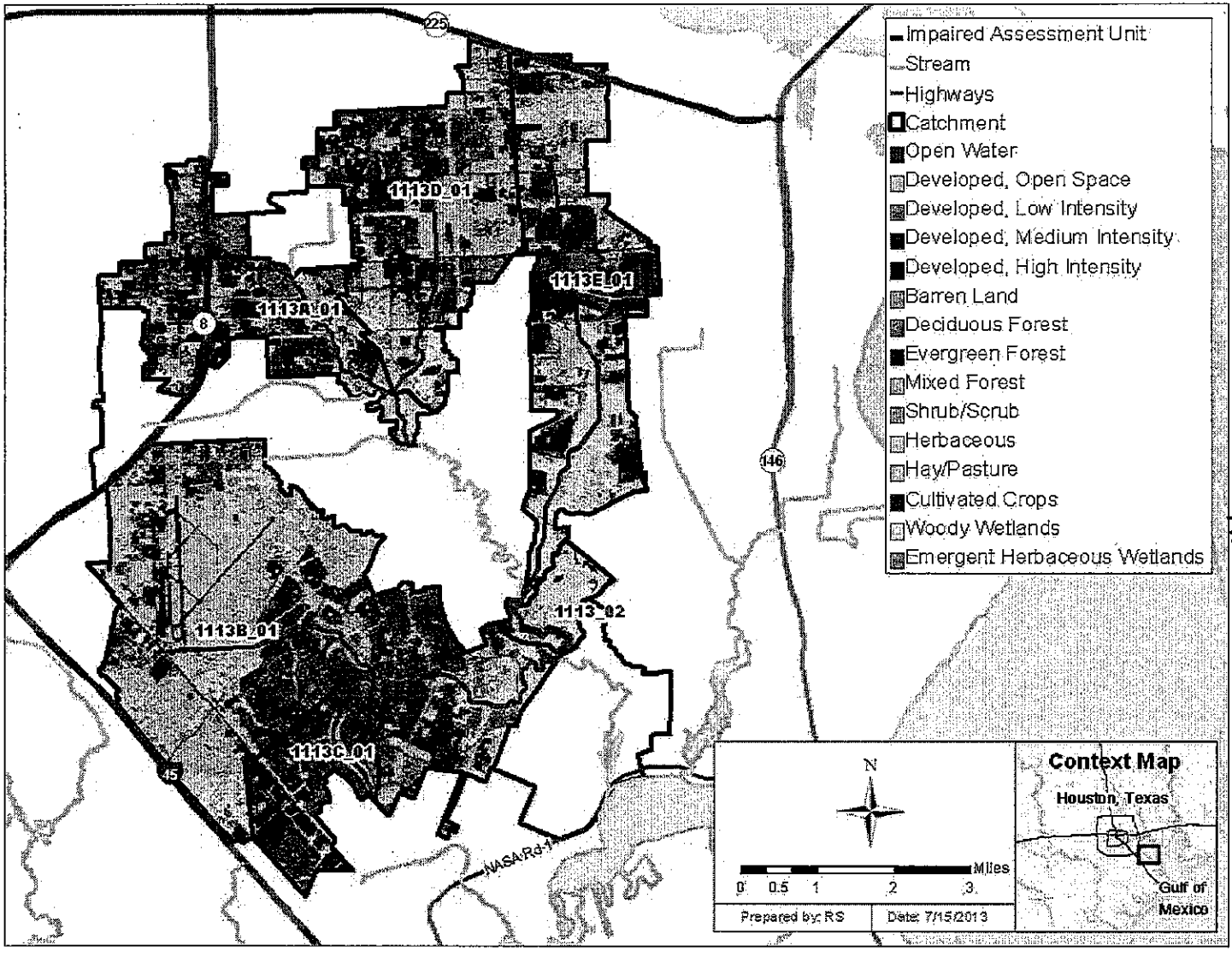

Figure 1-3: Land Cover Map

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1.2.3 Precipitation

There are six rain gages located within the watershed (Figure 1-4) and two additional gages just outside the watershed boundaries that were used in this study. The gages are maintained by the Harris County Office of Homeland Security and Emergency Management (HCOEM). Table 1-6 summarizes total annual rainfall for the eight gages for a 13-year period. It should be noted that two gages, Gage 260 and Gage 640, were not operational until 2005. The region has high levels of humidity and receives annual precipitation ranging between 46.2 and 52.6 inches per year as shown in the table. Based on data for the period 2000 to 2012, the watershed average is around 49.9 inches per year.

To evaluate the distribution of rainfall across the watershed, Thiessen polygons were developed for each rainfall gage as shown in Figure 1-4. In general, coastal areas reported higher average rainfall than those areas farther inland. Average rainfall by subwatershed was also calculated and summarized in Table 1-7. Average rainfall amounts ranged from 46.6 inches in Armand Bayou Above Tidal watershed to 52.0 inches in Armand Bayou Tidal watershed.

To supplement the HCOEM rainfall data, annual average precipitation data were also compiled for the time period 1981 to 2010 based on the national data set from PRISM Group (PRISM Group 2006) summarized in Table 1-8. The annual average precipitation values for each subwatershed derived from PRISM in this portion of Texas range between 54.73 and 55.78 inches per year. The PRISM data indicate a slightly higher average annual precipitation for the Armand Bayou Watershed than the rainfall gages of the HCOEM, likely due to the drought in recent years (2010-2011) that may be skewing the rainfall totals lower. Therefore, the PRISM average values were used to support the development of flow duration curves described later in this document (Section 4).

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Table 1-7: Annual Totals at HCOEM Rainfall Gages in Armand Bayou Watershed

Gage number	Year													Average
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Gage 140	47.1	69	70.3	42.5	60	35	65.8	72.1	32.9	27.7	60.5	25.1	54.0	50.9
Gage 210	53.2	75.6	67.7	53.3	56.7	35.5	52.5	67.0	39.5	33.1	47.2	25.4	53.5	50.8
Gage 220	44.4	76.1	63.7	44.2	56.6	27	61.2	70.1	47.5	50.4	49.7	26.4	40.6	50.6
Gage 230	33	82.1	59.3	43.4	60	36.2	62.5	77.5	49.3	56.4	47.4	26.4	50.4	52.6
Gage 240	37.8	65.1	65.4	46.3	58.6	31.2	58.4	74.7	42.2	44.2	40.9	23.4	53.7	49.4
Gage 250	40.7	69.6	64.2	50.3	58.6	35.8	56.6	72.2	29.3	61.6	55.1	27.0	56.1	52.1
Gage 270	N/A	N/A	N/A	N/A	N/A	35.4	59.9	75.4	46.1	34.2	43.3	25.5	50.0	46.2
Gage 640	N/A	N/A	N/A	N/A	N/A	38.6	62.3	81.0	41.5	37.7	42.6	22.7	47.2	46.7
Average rainfall across watershed (inches)														49.9

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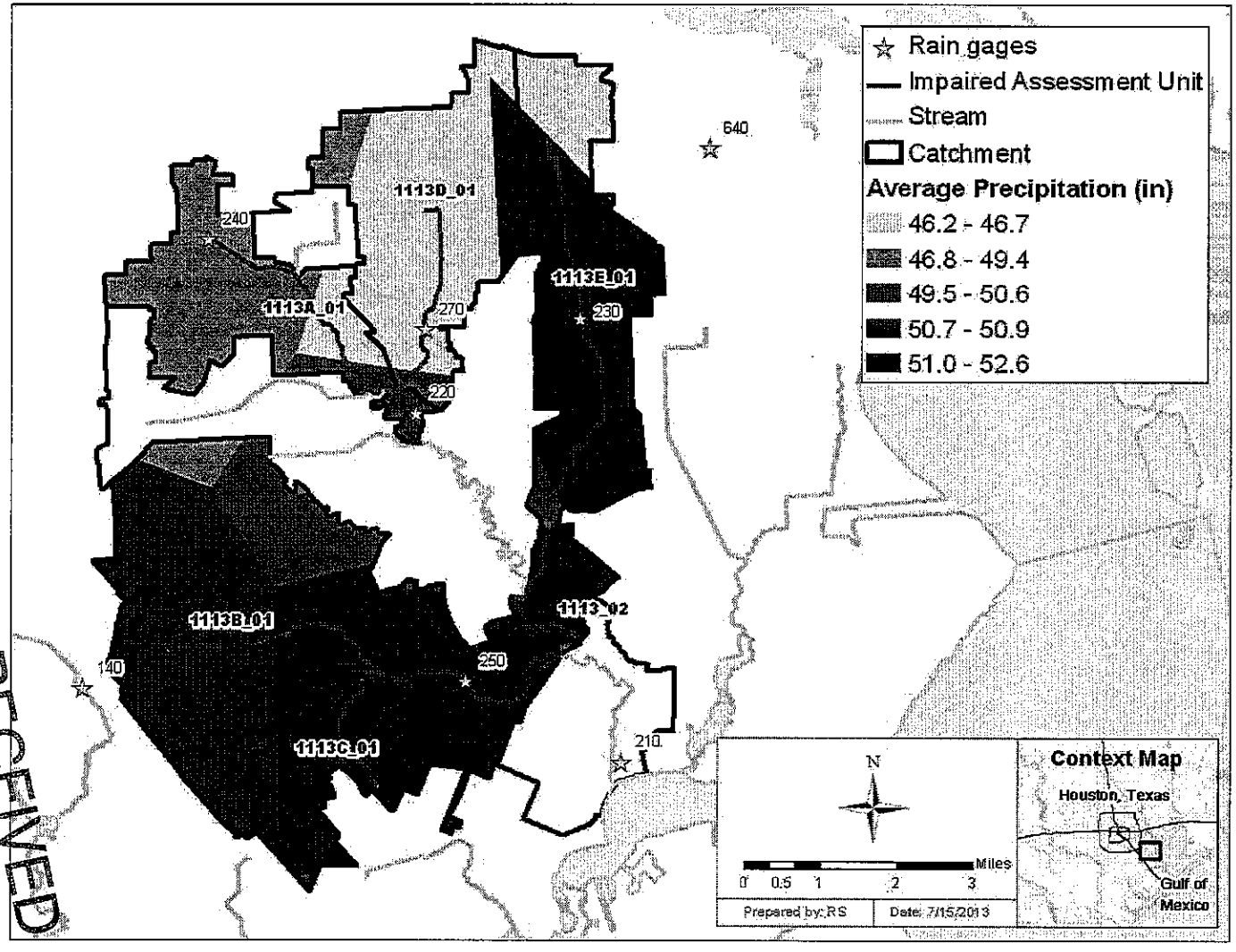

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Figure 1-4: HCOEM Precipitation Map

Table 1-8: Average Annual HCOEM Precipitation in Armand Bayou Subwatersheds, 2000-2013

Segment Name	Assessment Unit	Average Annual (Inches)
Armand Bayou Tidal	1113_02	52.0
Armand Bayou Above Tidal	1113A_01	46.6
Horsepen Bayou Tidal	1113B_01	51.2
Unnamed Tributary to Horsepen Bayou	1113C_01	51.9
Willow Springs Bayou	1113D_01	50.3
Big Island Slough	1113E_01	51.8

Table 1-9: PRISM Annual Average Precipitation, 1981-2010

Segment Name	Assessment Unit	Average Annual (Inches)
Armand Bayou Tidal	1113_02	55.8
Armand Bayou Above Tidal	1113A_01	54.7
Horsepen Bayou Tidal	1113B_01	55.4
Unnamed Tributary to Horsepen Bayou	1113C_01	55.8
Willow Springs Bayou	1113D_01	54.8
Big Island Slough	1113E_01	55.2

Source: PRISM Group 2006

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1.2.4 Ambient Water Quality

Considerable amounts of ambient water quality data are available to support water quality assessment and development of TMDLs for segments in the Armand Bayou Watershed. Historical indicator bacteria data for the period 2000 to 2012 were obtained from the TCEQ Surface Water Quality Monitoring Information System (SWQMIS) database. Seventy percent of the data correspond to *Escherichia coli* samples (608 samples), 29 percent correspond to enterococci samples (253 samples), while 1 percent correspond to fecal coliform samples (13 samples).

Table 1-9 summarizes the historical ambient water quality data for indicator bacteria (2000-2012) for select TCEQ Water Quality Monitoring (WQM) stations in the Armand Bayou Watershed. Figure 1-5 shows the locations of the WQM locations with indicator bacteria data. The complete ambient water quality data set for bacteria used to prepare Table 1-9 is provided in Appendix A. Table 1-9 presents the number of indicator bacteria samples, as well as the geometric mean of the concentrations for each indicator, and the number and percentage of single sample exceedances of the Texas SWQS. A more in-depth discussion of the analysis of this data set is provided in Subsections 2.3 and 2.4.

Table 1-10: Historical Water Quality Data for TCEQ Stations from 2000 to 2012

Assessment Unit	Station ID	Indicator Bacteria	Geometric Mean Concentration (MPN/100ml)	Number of Samples	Number of Samples Exceeding Single Sample Criterion	% of Samples Exceeding
1113_02	11503	EC	271.4	35	16	45.7%
		ENT	42.8	110	32	29.1%
1113A_01	11404	EC	204.6	111	37	33.3%
	11405	EC	56.3	5	0	0.0%
	17488	EC	1,179.3	82	57	69.5%
1113B_01	11409	EC	205.8	37	12	32.4%
		ENT	58.4	87	26	29.9%
	17317	ENT	64.7	31	9	29.0%
1113C_01	17485	EC	215.1	108	34	31.5%
1113D_01	17487	EC	744.0	109	74	67.9%
1113E_01	17486	EC	608.7	105	65	61.9%

EC: E coli, ENT: enterococci
Geometric Mean Criteria: 126 MPN/100 ml for EC, 35 MPN/100 ml for ENT.
Single Sample Criteria: 399 MPN/100 ml for EC, 104 MPN/100 ml for ENT.
Highlighted stations are tidally influenced.
Geometric mean concentrations were calculated assuming one-half the value of any concentration reported as less than the detection limit

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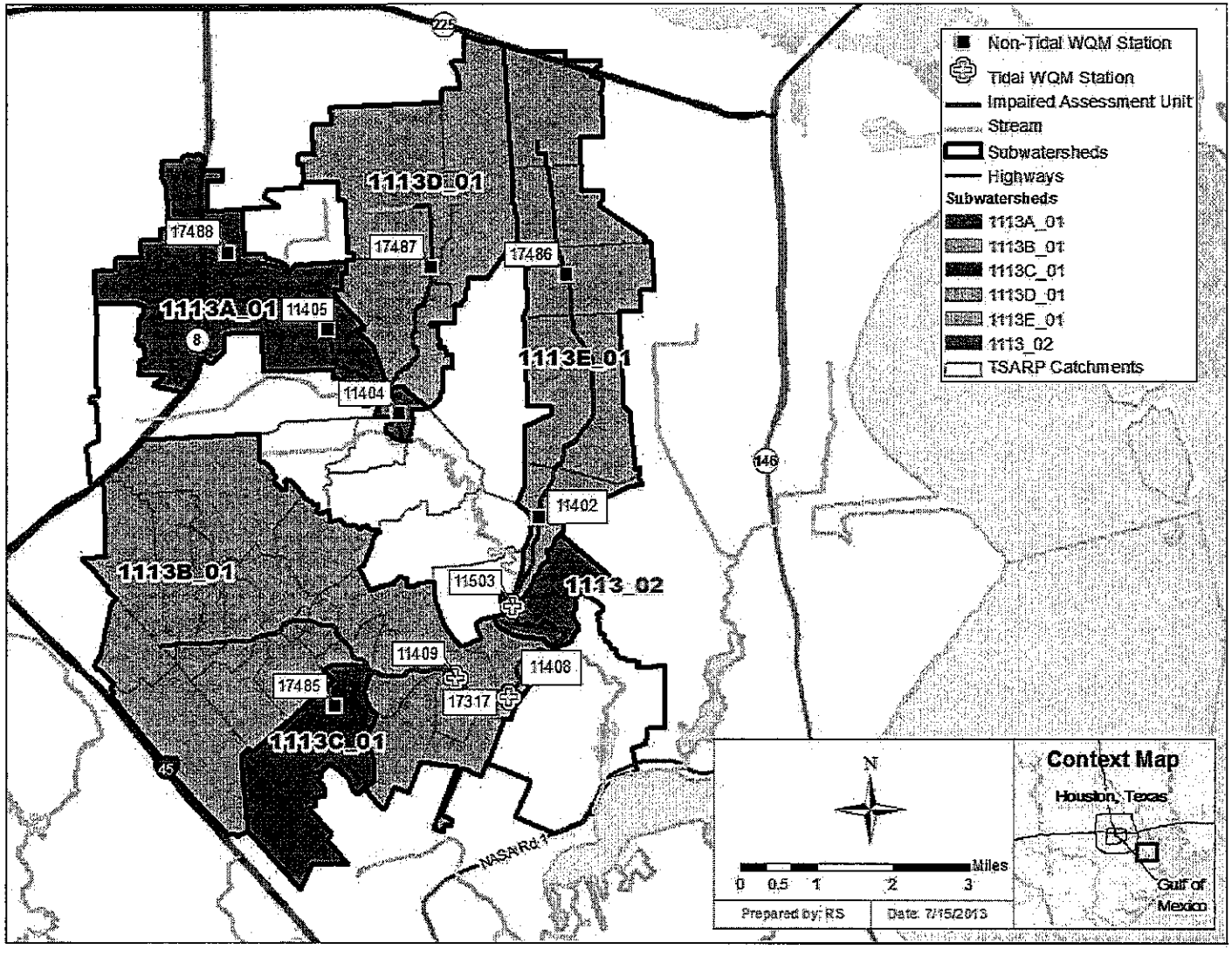

Figure 1-5: WQM Station Locations

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1.2.5 Stream Flow Data

Stream flow data is key information when conducting water quality assessments such as TMDLs. The U.S. Geological Survey (USGS) does not maintain any current flow gages in the Study Area. To address this deficiency, flow projections were developed for the freshwater streams in the Armand Bayou Watershed using long-term flow records from USGS gage stations in surrounding watersheds as will be described in Appendix F.

1.2.6 Tide Data

Tide data were compiled to support the assessment and modeling of bacteria loading in the tidal segments of Armand Bayou. There are no tide gages currently located in Armand Bayou Watershed, however there is some significant historical tide data for the area. The closest gages that provide data regarding tides are as follows:

- The Texas Coastal Ocean Observation Network (TCOON) operated Station 502 near the mouth of Armand Bayou at Clear Lake Park. This gage had been in operation since 1991 but was damaged in Hurricane Ike and is no longer active as of September 13, 2008.
- The USGS operates Gage 08077637 at the mouth of Clear Lake into Galveston Bay. This gage is the next closest tide gage for the area. This gage has been in operation since 2007 and continues to operate at this time.

Data from these sites were plotted and are presented in Figure 1-6. As shown in the Figure, the tide at the TCOON gage is on average 5.05 ft higher than the water level reported at the USGS gage at the mouth of Clear Lake. A spreadsheet of these data are provided in Appendix C.

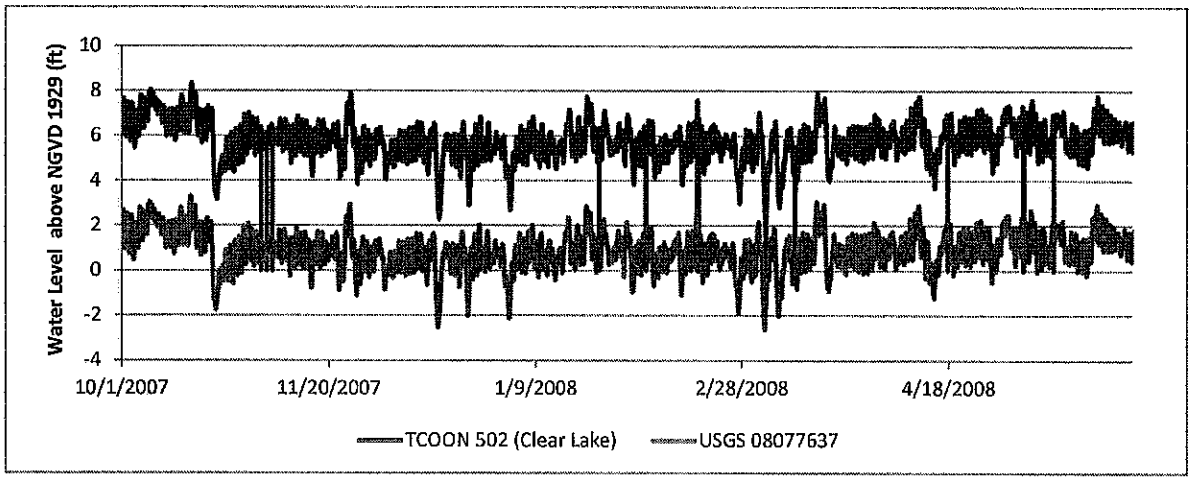

Figure 1-6: Tide Data Near Armand Bayou Watershed (TCOON Station 502 and USGS Gage 08077637)

1.3 Armand Bayou Seasonality

Seasonal differences in indicator bacteria concentrations were assessed by comparing historical bacteria concentrations collected in the warmer months versus those collected during

the cooler months. The monthly average temperatures for Houston obtained from NOAA (Table 1-12) and were used to divide the data sets into warmer (25 – 29°C) and cooler months (12 – 21°C). Based on these temperature ranges, November, December, January, February, and March were considered the cooler months; May, June, July, August, and September were warmer months.

Table 1-11: Average Monthly Temperatures for Houston Hobby AP, TX (1981-2010)

Month	Daily Max (°C)	Daily Min (°C)	Daily Mean (°C)	Classification
Jan	17.4	7.3	12.4	Cool
Feb	19.5	9.2	14.3	Cool
Mar	23.1	12.7	17.9	Cool
Apr	26.3	15.9	21.1	n/a
May	29.9	20.1	25	Warm
Jun	32.8	23.1	27.9	Warm
Jul	34.2	24.1	29.2	Warm
Aug	34.1	24.1	29.1	Warm
Sep	31.8	22	26.9	Warm
Oct	27.8	16.8	22.3	n/a
Nov	22.5	11.9	17.2	Cool
Dec	18.6	8.2	13.4	Cool

Note: Temperature values from NOAA Houston Hobby Station (degrees Fahrenheit) have been converted to degrees Celsius. http://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/climate-normals/1981-2010-normals-data

To determine if there was a statistically significant difference between cool and warm months, a *t*-test was conducted on log transformed data between the warmer months and cooler months for WQM stations with six or more bacteria samples. Geometric means were also calculated for the warmer and cooler months. Table 1-13 shows seasonal variation for two stations for *E coli* and enterococci in addition to *E coli* only at several other stations.

For *E coli*, two of the four stations with six or more samples exhibited higher geometric mean concentrations for the colder months than the warmer months. No station showed statistically significant differences at the 95% confidence interval between the warmer and cooler months. For enterococci, both stations have slightly higher geometric mean concentrations during the cooler months, but neither difference was statistically significant.

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Table 1-12: Seasonal Differences for *E coli* and enterococci Concentrations

Segment	Station ID	Indicator	Warm Months		Cold Months		*p*-value
			n	Geomean (MPN/100 ml)	n	Geomean (MPN/100 ml)	
1113_02	11503	EC	5	87.9	4	871.9	0.13
1113_02	11503	ENT	33	26.5	34	32.8	0.64
1113B_01	11409	ENT	32	38.8	34	49.5	0.66
1113C_01	17485	EC	24	200.1	31	194.0	0.94
1113D_01	17487	EC	25	443.3	31	647.4	0.35
1113E_01	17486	EC	26	677.1	29	496.7	0.54

EC: E coli, ENT: enterococci; n = number of samples
Highlighted rows correspond to stations for which the warm and cold datasets are significantly different at a 95% confidence interval.
p-value is based on a t-test conducted at each station using single sample concentrations.
All concentrations are in counts/dL; values less than the detection limit were treated in calculations as one-half the detection lim,it.

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CHAPTER 2
PROBLEM IDENTIFICATION AND WATER QUALITY TARGET

2.1 Pollutant of Concern: Characteristics of Bacterial Indicators

The contact recreation use is assigned to almost every designated water body in the State of Texas, although full support of the contact recreation use is not a guarantee that the water is completely safe of disease-causing organisms. The evolution of the contact recreation criteria currently used by Texas began with criteria first published in 1968 based on general studies done on lakes in the Midwest and New York using fecal coliform bacteria as an indicator of the potential presence of fecal contamination (USEPA 1986). The USEPA-recommended criteria for recreational waters in 1976 included a geometric mean criterion: no more than 200 counts/dL based on five samples collected over a 30-day period; and an instantaneous criterion: no more than 10 percent of the individual grab samples could exceed 400 counts/dL (USEPA 1986). Shortly thereafter, these recommended criteria were adopted by the State of Texas in its SWQSs. The fecal coliform criteria, and the studies on which they were based, were heavily criticized by the USEPA in 1986 (USEPA 1986) following an extensive program of epidemiology testing. During that decade, USEPA studies found that fecal coliform was not a good predictor of the risk of disease and recommended new tests and criteria. The USEPA recommended new criteria for swimming areas, using *E coli* and enterococci as new fecal indicator organisms, and incorporating the idea of varying criteria with the level of swimming use.

In Texas, three indicator bacteria have been analyzed in water samples collected to determine support of the contact recreation use: fecal coliform and *E coli* in freshwater and fecal coliform and enterococci in marine waters. Currently, *E coli* and enterococci bacteria are measured to determine the relative risk of contact recreation, depending on whether the water body is fresh or marine. The presence of these bacteria indicates that associated pathogens from the fecal waste of warm-blooded species (human or animal) may be reaching a body of water. High concentrations of certain bacteria in water indicate there may be an increased risk of becoming ill from recreational activities.

Texas water quality standards (WQS) for contact recreation allow exemptions for waterbodies where elevated bacteria concentrations frequently occur due to sources of pollution that cannot be reasonably controlled by the existing regulations, or where recreation is considered unsafe for other reasons, such as barge or ship traffic (e.g., the Houston Ship Channel), unrelated to water quality. This exemption and reclassification to less strict "noncontact recreation" standards has been applied to only a few waterbodies in Texas.

2.2 TCEQ Water Quality Standards for Contact Recreation

The TCEQ is responsible for administering provisions of the constitution and laws of the State of Texas to promote judicious use of and protection of the quality of waters in the state. Included in this responsibility is the continuous monitoring and assessment of water quality to evaluate compliance with SWQSs established within Texas Water Code, §26.023 and Title 30 Texas Administrative Code (TAC), §§307.1-307.10. Texas SWQS, 30 TAC 307.4, specify the designated uses and general criteria for all surface waters in the state.

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This report focuses on six waterbodies within the Armand Bayou Watershed that are on the federal Clean Water Act §303(d) list because they do not support contact recreation use. Table 2-1 lists all the assessment units within Armand Bayou that are on the 2012 303(d) list and provides a description of those assessment units. Table 2-2 summarizes the designated uses and the applicable bacteria indicators used to assess the contact recreation use of each waterbody addressed in this report. Table 2-1 also identifies the year each waterbody was placed on the Texas' Clean Water Act §303(d) List for nonsupport of contact recreation use, the stream length in miles, and other designated uses for each waterbody. The TMDLs in this report only address the contact recreation use.

Table 2-1: Synopsis of Texas 2012 303(d) List

Assessment Unit	Segment Name	Description	Category	Year First Listed
1113_02	Armand Bayou Tidal	From the Horsepen Bayou confluence to the Big Island Slough confluence	5c	2006
1113A_01	Armand Bayou Above Tidal	From the upper segment boundary of Armand Bayou Tidal (point 0.8 km (0.5 miles) downstream of Genoa-Red Bluff Road) upstream to Beltway 8	5b	1998
1113B_01	Horsepen Bayou Tidal	From the Armand Bayou confluence to the SH3	5c	2006
1113C_01	Unnamed Tributary to Horsepen Bayou	From the Horsepen Bayou confluence to Reseda Drive	5c	2010
1113D_01	Willow Springs Bayou	From the Armand Bayou confluence to a point 2.8 km (1.8 mi) upstream to an unnamed tributary	5c	2010
1113E_01	Big Island Slough	From the Armand Bayou confluence upstream to a point 2.4 km (1.5 mi) north of Spencer Hwy	5c	2012

Table 2-2: Synopsis of Texas Integrated Report for the Armand Bayou Watershed

Assessment Unit	Segment Name	Parameter	Designated Use*				Year Impaired	Stream Length (miles)
			CR	AL	GU	FC		
1113_02	Armand Bayou Tidal	ENT	FS	NS	FS	NS	2006	1.8
1113A_01	Armand Bayou Above Tidal	*E coli*	NS	NS	NA	NA	1998	4.6
111B_01	Horsepen Bayou Tidal	ENT	NS	FS	NA	NA	2006	6.7
1113C_01	Unnamed Tributary to Horsepen Bayou	*E coli*	NS	FS	NA	NA	2010	2
1113D_01	Willow Springs Bayou	*E coli*	NS	FS	NA	NA	2010	2.9
1113E_01	Big Island Slough	*E coli*	NA	NA	NA	NA	2012	6.5

**CR: Contact recreation; AL: Aquatic Life; GU: General Use; F: Fish Consumption; ENT: enterococci, NS = Not Supporting; FS = Fully Supporting; NA= Not Assessed*

The excerpts below from Chapter 307, Texas SWQS stipulate how water quality data were assessed to determine support of contact recreation use as well as how the water quality targets are defined for each bacterial indicator. In addition to the specific requirements of §307.7 outlined below, the TMDLs for the Armand Bayou Watershed will also adhere to §307.5 of the SWQS which defines the antidegradation policy and procedures that apply to authorized wastewater discharges, TMDLs, waste load evaluations, and any other miscellaneous actions, such as those related to man-induced nonpoint sources of pollution, which may impact the water in the state.

Excerpted from 30 Texas Administrative Code (TAC) §307.7. Site-specific Uses and Criteria.

(a) Uses and numerical criteria are established on a site-specific basis in Appendices A,B,D,E,F and G of §307.10 of this title (relating to Appendices A - G). Site-specific uses and numerical criteria may also be applied to unclassified waters in accordance with §307.4(h) of this title (relating to General Criteria) and §307.5(c) of this title (relating to Antidegradation). Site-specific criteria apply specifically to substances attributed to waste discharges or human activities. Site-specific criteria do not apply to those instances in which surface waters exceed criteria due to natural phenomena. The application of site-specific uses and criteria is described in §307.8 of this title (relating to the Application of Standards) and §307.9 of this title (relating to the Determination of Standards Attainment).

(b) Appropriate uses and criteria for site-specific standards are defined as follows.

(1) Recreation. Recreational use consists of four categories – primary contact recreation, secondary contact recreation 1, secondary contact recreation 2, and noncontact recreation waters. Classified segments are designated for primary contact recreation unless sufficient site-specific information demonstrates that elevated concentrations of indicator bacteria frequently occur due to sources of pollution which cannot be reasonably controlled by existing regulations, wildlife sources of bacteria are unavoidably high and there is limited aquatic recreational potential, or primary or secondary contact recreation is considered unsafe for other reasons such as ship or barge traffic. In a classified segment where contact recreation is considered unsafe for reasons unrelated to water quality, a designated use of noncontact recreation may be assigned criteria normally associated with contact recreation. A designation of primary or secondary contact recreation is not a guarantee that the water so designated is completely free of disease-causing organisms. Indicator bacteria, although not generally pathogenic, are indicative of potential contamination by feces of warm blooded animals. The criteria for contact recreation are based on these indicator bacteria, rather than direct measurements of pathogens. Criteria are expressed as the number of bacteria per 100 milliliters (ml) of water (in terms of colony forming units, most probable number, or other applicable reporting measures). Even where the concentration of indicator bacteria is less than the criteria for primary or secondary contact recreation, there is still some risk of contracting waterborne diseases. Additional guidelines on minimum data requirements and procedures for evaluating standards attainment are specified in the TCEQ Guidance for Assessing and Reporting Surface Water Quality Data in Texas, as amended.

(A) Freshwater

(i) Primary contact recreation. The geometric mean criterion for E coli is 126 per 100 mL. In addition, the single samples criterion for E coli is 399 per 100 mL.

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(ii) Secondary contact recreation 1. The geometric mean criterion for E coli is 630 per 100 mL.

(iii) Secondary contact recreation 2. The geometric mean criterion for E coli is 1,030 per 100 mL.

(iv) Noncontact recreation. The geometric mean criterion for E coli is 2,060 per 100 mL.

(v) For high saline inland water bodies where enterococci is the recreational indicator for instream bacteria sampling at all times for the classified water body and for the unclassified water bodies that are within the watershed of that classified segment, unless it is demonstrated that an unclassified water body is not high saline. E coli is the applicable recreational indicator for instream bacteria sampling at all times for unclassified water bodies where conductivity values indicate that the water bodies are not high saline. For high saline water bodies with primary contact recreation, the geometric mean criterion for enterococci is 33 per 100 ml and the single sample criterion is 78 per 100 ml. For high saline inland waters with secondary contact recreation 1, the geometric mean criterion for enterococci is 165 per 100 ml. For high saline inland waters with secondary contact recreation 2, the geometric mean criterion for enterococci is 270 per 100 ml. For high saline inland water bodies with noncontact recreation, the geometric mean criterion for enterococci is 540 per 100 ml.

(B) Saltwater

(i) Primary contact recreation. The geometric mean criterion for enterococci is 35 per 100 mL. In addition, the single sample criterion for enterococci is 104 per 100 mL.

(ii) Secondary contact recreation 1. A secondary contact recreation 1 use for tidal streams and rivers can be established on a site-specific basis in §307.10 of this title if justified by a use-attainability analysis and the water body is not a coastal recreation water as defined in the Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH Act). The geometric mean criterion for enterococci is 175 per 100 mL.

(iii) Noncontact recreation. A noncontact recreation use for tidal streams and rivers can be established on a site-specific basis in §307.10 of this title if justified by a use-attainability analysis and the water body is not a coastal recreation water as defined in the BEACH Act. The geometric mean criterion for enterococci is 350 per 100 mL.

(C) Fecal coliform bacteria. Fecal coliform bacteria can be used as an alternative instream indicator of recreational suitability in high saline inland water bodies where enterococci is the designated recreational indicator in Appendix A of §307.10 of this title for two years after the adoption of this title to allow time to collect sufficient data for enterococci. Fecal coliform criteria for high saline inland water bodies are as follows:

(i) Primary contact recreation. The geometric mean criterion for fecal coliform is 200 per 100 mL. In addition, single sample criterion for fecal coliform is 400 per 100 mL.

(ii) Secondary contact recreation 1 and 2. The geometric mean criterion for fecal coliform is 1,000 per 100 mL.

(iii) Noncontact recreation. The geometric mean criterion for fecal coliform is 2,000 per 100 mL.

(D) Swimming advisory programs. For areas where local jurisdictions or private property owners voluntarily provide public notice or closure based on water quality, the use of any single sample or short-term indicators of recreational suitability are selected at the discretion of the local managers of aquatic recreation. Guidance for single-sample bacterial indicators is available in the USEPA document entitled Ambient Water Quality Criteria for Bacteria - 1986. Other short-term indicators to assess water quality suitability for recreation -- such as measures of streamflow, turbidity, or rainfall -- may also be appropriate.

A minimum of 10 samples from the last seven years or the most recently collected 10 samples for up to ten years are used to determine use support

As stipulated in 2010 *Guidance for Assessing and Reporting Surface Water Quality in Texas* (TCEQ 2010), utilization of the geometric mean to determine compliance for any of the bacterial indicators depends on the collection of a *minimum of 10 samples from the last seven years or the most recently collected 10 samples for up to ten years are used to determine use support.* The 2010 *Guidance for Assessing and Reporting Surface Water Quality in Texas* (TCEQ 2010) specifically states the following:

- *Ten samples will also be required for listing and delisting water bodies for which the assessment method is based on an average. Larger sample sizes increase the state's confidence that impairments are not missed. Although we will use more than 10 samples, if available, it is not reasonable at this time to require more than 10 samples for a minimum data set, given the monitoring resources and currently available data.*
- *The 2010 assessment period of record for the last seven years is December 1, 2001 through November 30, 2008. Samples from these seven years are evaluated when available, and if necessary, the most recent samples collected in the preceding three years (December 1, 1998 through November 30, 2000) can also be included to meet the requirements for minimum sample*

2.3 Problem Identification

Pursuant to §303(d) of the federal Clean Water Act, states must establish TMDLs for pollutants contributing to violations of WQSs. Table 2-2 identifies the waterbodies requiring TMDLs identified in Category 5 of the 2012 Texas Water Quality Inventory and §303(d) List (TCEQ 2012). Between 1996 and 2010 as the TCEQ WQSs and water quality assessment method were modified and additional water quality data were collected throughout the Armand Bayou Watershed, areas of impairment were added to the §303(d) List. Table 2-2 lists the TCEQ WQM stations from which ambient water quality data were summarized to support the decision to place these waterbodies on the TCEQ 303(d) List. The waterbodies requiring the TMDLs were first listed in 1998. The locations of these WQM stations are displayed in Figure 2-1 and on this map each station is designated as a tidal or non-tidal station.

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A number of changes have occurred in the past 10 years that warrant refinements in how indicator bacteria data are used to support water quality assessments and TMDL development in Texas. Some key factors that influence which indicator bacteria to use for water quality assessment and TMDL development and the period of record to use include:

- Changes in land cover and locations of Texas Pollution Discharge Elimination System (TPDES)-permitted facilities
- changing the indicator bacteria in the 2000 TCEQ surface water quality standards (SWQS) from fecal coliform to *E coli* for fresh water, and enterococci for marine waters
- Refinements in the TCEQ surface water quality monitoring procedures
- Changes in the TCEQ guidance, *Assessing and Reporting Surface Water Quality in Texas*

As a result of these evolving factors in the water quality management arena associated with the protection and maintenance of contact recreation use, the historical data set used to support the TMDLs in this report have been narrowed, wherever possible, to utilize only *E coli* and enterococci data from 2003 through 2011.

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Table 2-3: Water Quality Monitoring Stations Used for 303(d) Listing Decision

Assessment Unit	Water Body	Description	Monitoring Station IDs	Year
1113_02	Armand Bayou Tidal	Armand Bayou Tidal at Bay Area Blvd north of NASA at middle of median between 2 bridges eastern shore	11503	2006
1113A_01	Armand Bayou Above Tidal	Armand Bayou Above Tidal 77 meters upstream of Dedman Street/West Pasadena Blvd in southeast Houston	17488	1998
		Armand Bayou at Fairmont Parkway along median at midpoint between bridges	11405	
		Armand Bayou at Genoa-Red Bluff Rd NE of Ellington AFB	11404	
1113B_01	Horsepen Bayou Tidal	Horsepen Bayou at Bay Area Blvd north of NASA	11409	2006
		Horsepen Bayou 1.4 km downstream of Bay Area Blvd 34m downstream of Middlebrook Dr. in southeast Houston	11408	
		Horsepen Bayou at Middlebrook Dr. in southeast Houston	17317	
1113C_01	Unnamed Tributary to Horsepen Bayou	Unnamed Tributary of Horsepen Bayou Tidal at Penn Hills	17485	2010
1113D_01	Willow Springs Bayou	Willow Spring at Bandridge Rd in southeast Houston	17487	2010
1113E_01	Big Island Slough	Big Island Slough at Hillridge Rd in southeast Houston	17486	2012
		Big Island Slough at Red Bluff Rd in southeast Houston mid-channel between the two bridges of divided road	11402	

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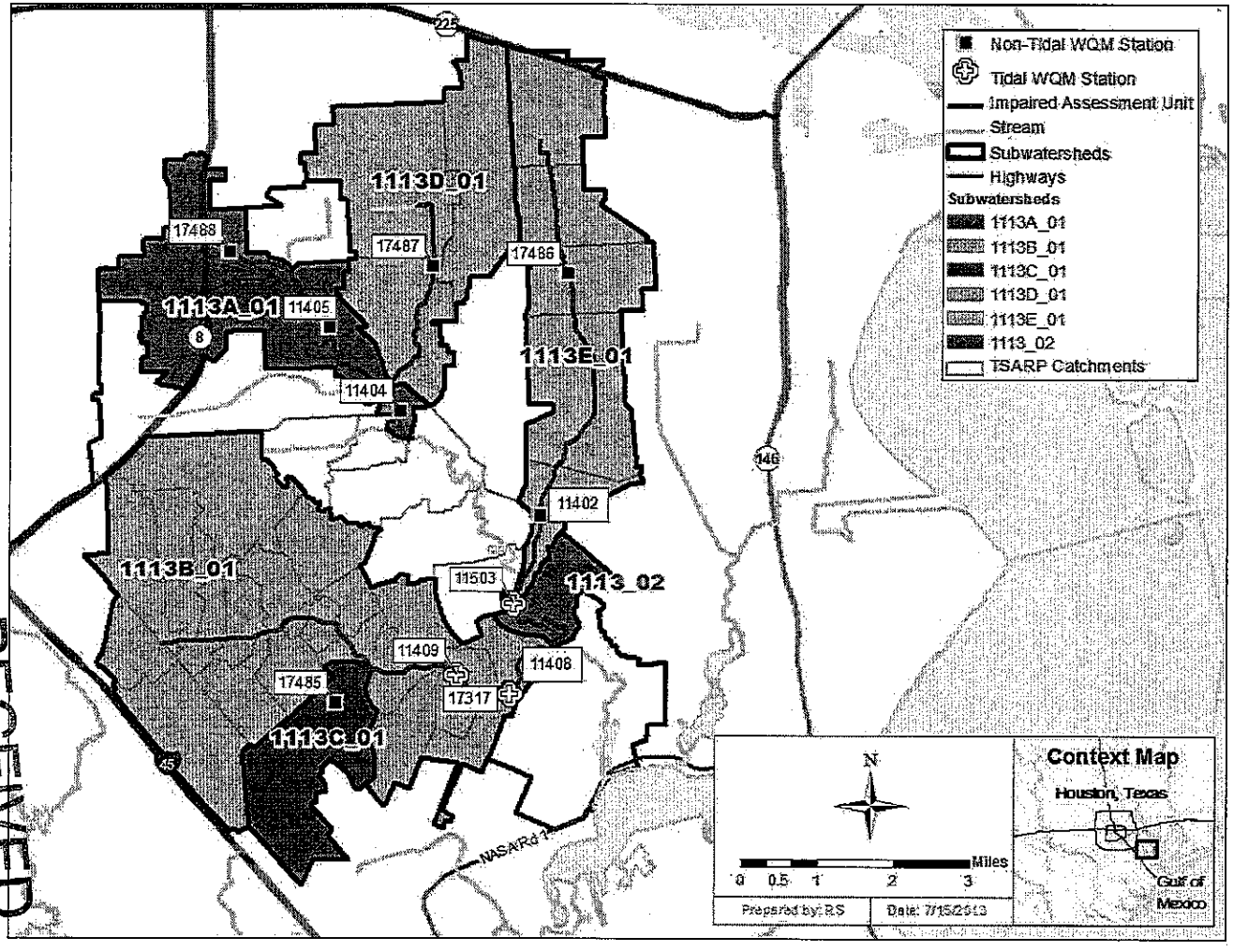

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Figure 2-1: TCEQ WQM Stations in the Armand Bayou Watershed

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2.4 Water Quality Targets for Contact Recreation

The Code of Federal Regulations (40 CFR §130.7(c)(1)) states that, "TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards." The Texas SWQSs (TCEQ 2010) provide numeric and narrative criteria to evaluate attainment of designated uses. The basis for water quality targets for all TMDLs developed in this report will be the numeric criteria for bacterial indicators from the 2010 Texas SWQSs as described in Subsection 2.2 above. *E coli* is the preferred indicator bacteria for assessing contact recreation use in freshwater, and enterococci is the preferred indicator bacteria in saltwater.

Several studies have been performed by the USEPA that show a stronger link between the concentrations of *E coli* and enterococci and the concentrations of fecal pathogens than the previous standard, fecal coliform. The USEPA studies found that in freshwater streams, *E coli* concentrations were the strongest predictor of illness following contact recreation. The TCEQ adopted the limit of 399 per dL for single samples of *E coli* and a geometric mean limit of 126 per dL for waterbodies that have been designated for contact recreation use. Within tidal streams and saltwater bodies, however, the USEPA determined that enterococci concentrations were the strongest predictor of illness. The TCEQ adopted a limit of 104 per dL for enterococci in any single sample, and a limit of 35 per dL for the geomean of all samples at any location for enterococci concentrations within a tidal stream designated for contact recreation uses (TCEQ 2010).

The water quality target for the TMDLs for freshwater segments is to maintain concentrations below the geometric mean criterion of 126 counts per dL for *E coli*. The water quality target for the TMDLs for tidal (saltwater) segments is to achieve concentrations of enterococci below the geometric mean criterion of 35 counts per dL. The tidal segments are Armand Bayou Tidal and Horsepen Bayou. Maintaining the geometric mean criterion for each indicator bacteria is expected to be protective of the single sample criterion also and therefore will ultimately result in the attainment of the contact recreation use. TMDLs will be based on a percent reduction goal required to meet the geometric mean criterion.

The water quality target for each waterbody will incorporate an explicit 5 percent margin of safety (MOS). For example, if *E coli* is utilized to establish the TMDL, then the water quality target would be 379 counts/dL, 5 percent lower than the single sample water quality criterion (399 counts/dL) and the geometric mean water quality target would be 120 counts/dL, 5 percent lower than the criterion value (126 counts/dL). For enterococci, the single sample water quality target would be 74 counts/dL and the geometric mean water quality target would be 31 counts/dL, both 5 percent lower than the criterion values.

For non-tidal segments, each water quality target will be used to determine the allowable bacteria load that is derived by using the actual or estimated flow record multiplied by the instream criteria minus a 5 percent MOS. For tidal segments, a mass-balance model will be used to determine the maximum amount of loading discharged to the water bodies that result in meeting the geometric mean criteria throughout the length of the segment.

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CHAPTER 3
POLLUTANT SOURCE ASSESSMENT

To support TMDL development, a pollutant source assessment attempts to characterize known and suspected sources of pollutant loading to impaired waterbodies. Pollutant sources within a watershed are categorized and quantified to the extent that information is available. Fecal bacteria such as *E coli* and Enterococcus originate in the intestines of warm-blooded species (human and animal), and sources of bacteria may be point (permitted) or nonpoint (unregulated) in nature.

Point sources are permitted through the National Pollution Discharge Elimination System (NPDES) program. Some stormwater runoff may be permitted through NPDES as municipal separate storm sewer systems (MS4). Other unregulated sources of stormwater runoff that typically cannot be identified as entering a waterbody through a discrete conveyance at a single location are often referred to as nonpoint sources. For example, unregulated sources include land activities that contribute bacteria to surface water as a result of rainfall runoff or on-site sewage system facilities. For the TMDLs presented in this report, all sources of pollutant loading not regulated by a NPDES/TPDES permit are considered nonpoint sources. The following discussion describes what is known regarding permitted and unregulated sources of bacteria in the impaired watersheds.

3.1 Point Sources: NPDES/TPDES-Permitted Sources

Under 40 CFR, §122.2, a point source is described as a discernible, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Under the Texas Water Code, TCEQ has adopted rules and procedures to issue permits to control the quantity and quality of discharges into or adjacent to waters of the state through the TPDES program. NPDES/TPDES-permitted facilities classified as point sources that may contribute bacteria loading to surface waters include:

- TPDES municipal wastewater treatment facilities (WWTF)
- TPDES industrial WWTF (stormwater and/or wastewater)
- TPDES municipal no-discharge WWTF
- TPDES regulated stormwater (municipal separate storm sewer systems)
- TPDES Concentrated Animal Feeding Operation (CAFO)

Point source discharges such as WWTFs could result in discharge of elevated concentrations of fecal bacteria if the plant is not properly maintained, is of poor design, or if flow rates exceed the treatment capability of the plant. Industrial WWTFs may contain fecal bacteria in their effluent. While no-discharge facilities do not discharge wastewater directly to a waterbody, it is possible that collection systems associated with these types of facilities may be a source of bacteria loading to surface waters. Permitted stormwater runoff from TPDES regulated discharge areas, called municipal separate storm sewer systems, may also contain high fecal bacteria concentrations. Finally, CAFOs are recognized by USEPA as significant potential source of pollution, and may have the potential to cause serious impacts to water quality if not properly managed.

Two watersheds in the Study Area, including Horsepen Bayou Tidal (1113B_01) and Big Island Slough (1113E_01) have NPDES/TPDES-permitted sources. A significant portion of the Study Area is regulated under the TPDES stormwater discharge permit jointly held by Harris County,

HCFCD, City of Houston, and Texas Department of Transportation. There are no NPDES-permitted CAFOs within the Study Area.

3.1.1 Permitted Sources: NPDES/TPDES Wastewater Facility Point Source Discharges

There are four TPDES-permitted facilities in the watershed; two of which are permitted to discharge treated domestic wastewater continuously to surface waters addressed in these TMDLs. The other two facilities are do not discharge into surface waters. The location of all four facilities is shown in Figure 3-1 with additional details on each provided in Table 3-1. As shown in Table 3-1, the permitted flows associated with the two continuously discharging facilities range between 5 and 10 MGD. The two facilities permitted in the watershed that don't have continuous discharges include an industrial stormwater discharge from Equistar Chemicals and a City of Houston Sludge Plant that is a permitted as a no discharge facility. There are no WWTFs located in the following segments/assessment units: Armand Bayou Above Tidal (1113A_01), Willow Springs Bayou (1113D_01), Armand Bayou Tidal (1113_02), or Unnamed Tributary of Horsepen Bayou (1113C_01) watersheds. Horsepen Bayou (1113B_01) contains both WWTFs.

TPDES-permitted facilities that discharge treated wastewater are required by their permit to monitor their effluent for certain parameters. A summary of the discharge monitoring report (DMR) data for the two domestic facilities in the watershed is shown in Table 3-2. In addition, collecting fecal indicator bacteria data for In the Armand Bayou watershed, only TPDES facility 10495-152 collects such data. Table 3-2 provides a summary of the self-reporting data available for the two facilities in the Study Area, while Table 3-3 lists the number of reported monthly exceedances of the daily average concentration of 35 cfu/100 mL, and the number of reported daily exceedances of the daily maximum of 89 cfu/100 mL. As shown in the tables, Facility 10495-152 exceeded enterococci permit limits four times during the monitoring time frame.

The discharge monitoring data for each of the plants is presented in Appendix D.

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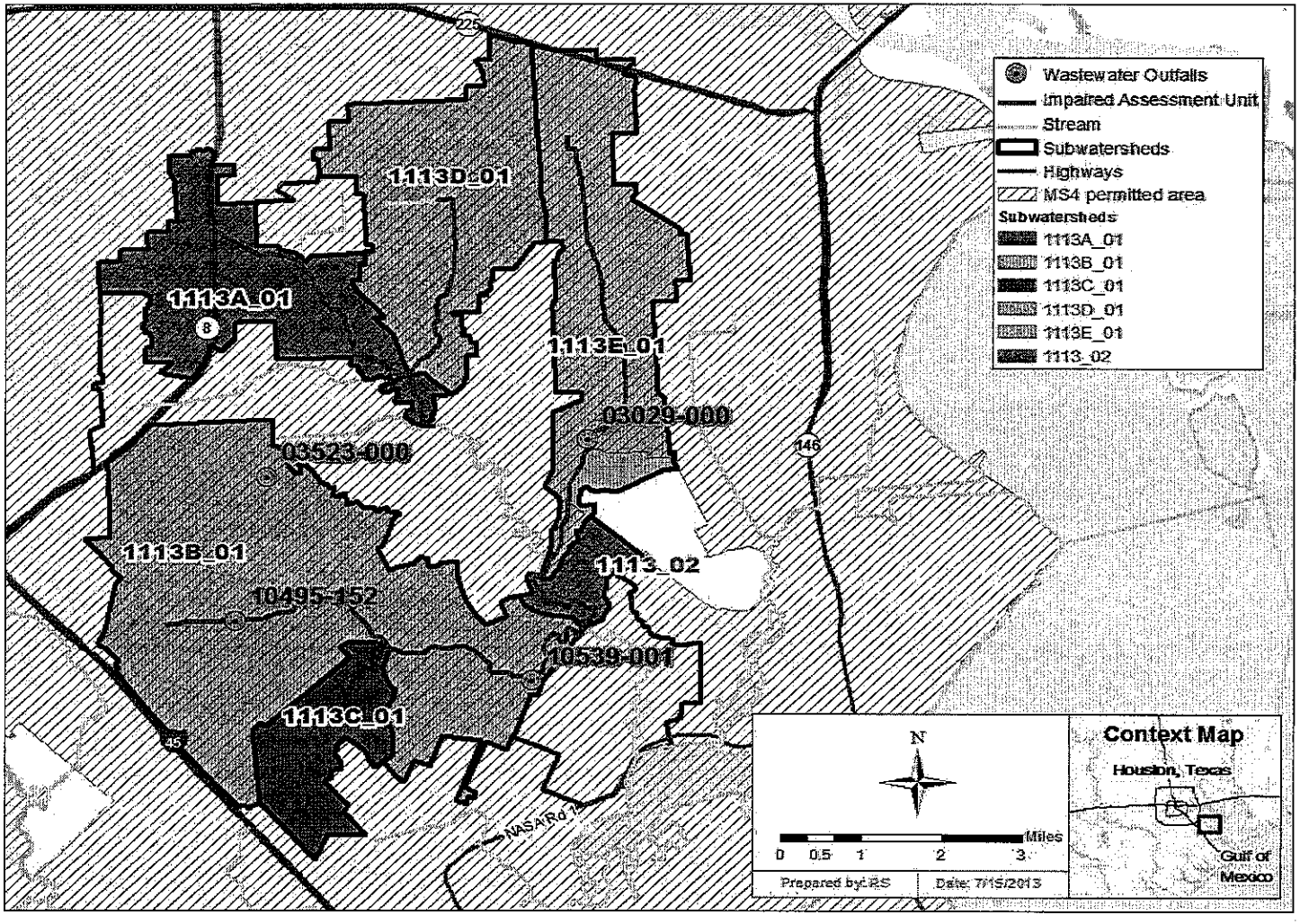

Figure 3-1: TPDES-Permitted Facilities in the Armand Bayou Watershed

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Table 3-1: TPDES-Permitted Facilities in the Study Area

Assessment Unit	Receiving Water	TPDES Number	NPDES Number	Facility Name	Facility Type	DTYPE	Permitted Flow (MGD)	Average Monthly Flow (MGD)
1113B_01	Horsepen Bayou Tidal	10495-152	TX0069736	Metro Central WWTP	Sewerage Systems	W	5	1.44
1113B_01	Horsepen Bayou Tidal	10539-001	TX0022543	Robert T Savely Water Reclamation Facility	Sewerage Systems	W	10	5.58
1113B_01	Horsepen Bayou Tidal	03523-000	TXL005000	City of Houston Sludge Plant	Water Supply	*n/a*	*n/a*	*n/a*
1113E_01	Big Island Slough	03029-000	TX0103900	Equistar Chemicals Bayport Complex	Industrial Stormwater	*n/a*	*n/a*	*n/a*

Source: TCEQ Wastewater Outfall Shapefile, August 2013, EPA, ICIS monitoring data search August 2013
MGD = Millions of Gallons per Day; n/a = Not Applicable
TYPE: D = Domestic < 1 MGD; W=Domestic >= 1 MGD

Table 3-2: DMR Data for Permitted Wastewater Discharges (November 2003-May 2013)

TPDES Number	NPDES Number	Facility Name	Assessment Unit	Stream Name	Dates Monitored		# of Records	Monthly Average Flow (MGD)*	Permitted Flow (MGD)
					Start	End			
10495-152	TX0069736	Metro Central WWTP	1113B_01	Horsepen Bayou Tidal	11/30/03	5/31/13	110	1.44	5
10539-001	TX0022543	Robert T Savely Water Reclamation Facility	1113B_01	Horsepen Bayou Tidal	12/31/04	5/31/13	101	5.58	10

Source: EPA, ICIS monitoring data search August 2013
*Notes: n/a = Not Available, MGD = Millions of Gallons per Day, cfu = Colony Forming Unit; *there were several missing monthly flow data points; these gaps were filled by taking average of flows for the previous and subsequent months.*

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Table 3-3: Enterococci Data for Permitted Wastewater Discharges (December 2009-May 2013)

Facility Name	TPDES Number	NPDES Number	No. Records	Avg Daily Average (cfu/100 mL)	Avg Monthly Maximum (cfu/100 mL)	Exceedances of Maximum Permit Limit (89 cfu/100 mL)		Exceedances of Average Permit Limit (35 cfu/100 mL)	
						Number	%	Number	%
Metro Central WWTP	10495-152	TX0069736	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Robert T Savely Water Reclamation Facility	10539-001	TX0022543	42	2.0	111.4	4	9.5%	0	*n/a*

Source: EPA, ICIS monitoring data search August 2013
Notes: MCMX = Measurement: Concentration Maximum, MCAV = Measurement: Concentration Average, n/a = Not Available

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3.1.2 Permitted Sources: Sanitary Sewer Overflows

Sanitary sewer overflows (SSO) are overflows from sanitary sewers that most often result from blockages in the sewer collection pipes caused by tree roots, grease and other debris. Occurrences of SSOs are permit violations that must be addressed by the responsible TPDES permittee.

The TCEQ maintains a database of SSO data collected from wastewater operators in the Armand Bayou Watershed. TCEQ Region 12-Houston provided a database for SSO data in the Armand Bayou Watershed (Laird 2013). These data are included in Table 3-4.

As can be seen from Table 3-4, there have been approximately 95 sanitary sewer overflows reported in the Armand Bayou watershed since August 2003. The reported SSOs averaged 3,539 gallons per event.

The locations and magnitudes of the all reported SSOs within the Armand Bayou watershed are displayed in Figure 3-2. It is important to note that some facilities, such as the City of Deer Park WWTF and Little Cedar Bayou WWTF, provide wastewater service within the boundary of the Armand Bayou Watershed but the facilities themselves do not discharge to Armand Bayou. The WWTF service area boundaries are shown in Figure 3-2. These data are included in Appendix F and summarized in Table 3-4.

Table 3-4: Sanitary Sewer Overflow (SSO) Summary

Facility Name	NPDES Permit No.	Facility ID	Number of Occurrences	Date Range		Amount (Gallons)	
				From	To	Min	Max
Robert T. Savely WWTF	TX0022543	10539-001	51	8/22/03	5/14/13	6	19,200
Metro Central WWTF	TX0069736	10495-152	2	4/18/12	5/12/12	200	1000
City of Deer Park WWTF	TX0025321	10519-002	21	9/26/03	6/26/13	50	10,000
Little Cedar Bayou WWTF	TX0022799	10206-001	23	6/11/06	4/27/13	15	72,000

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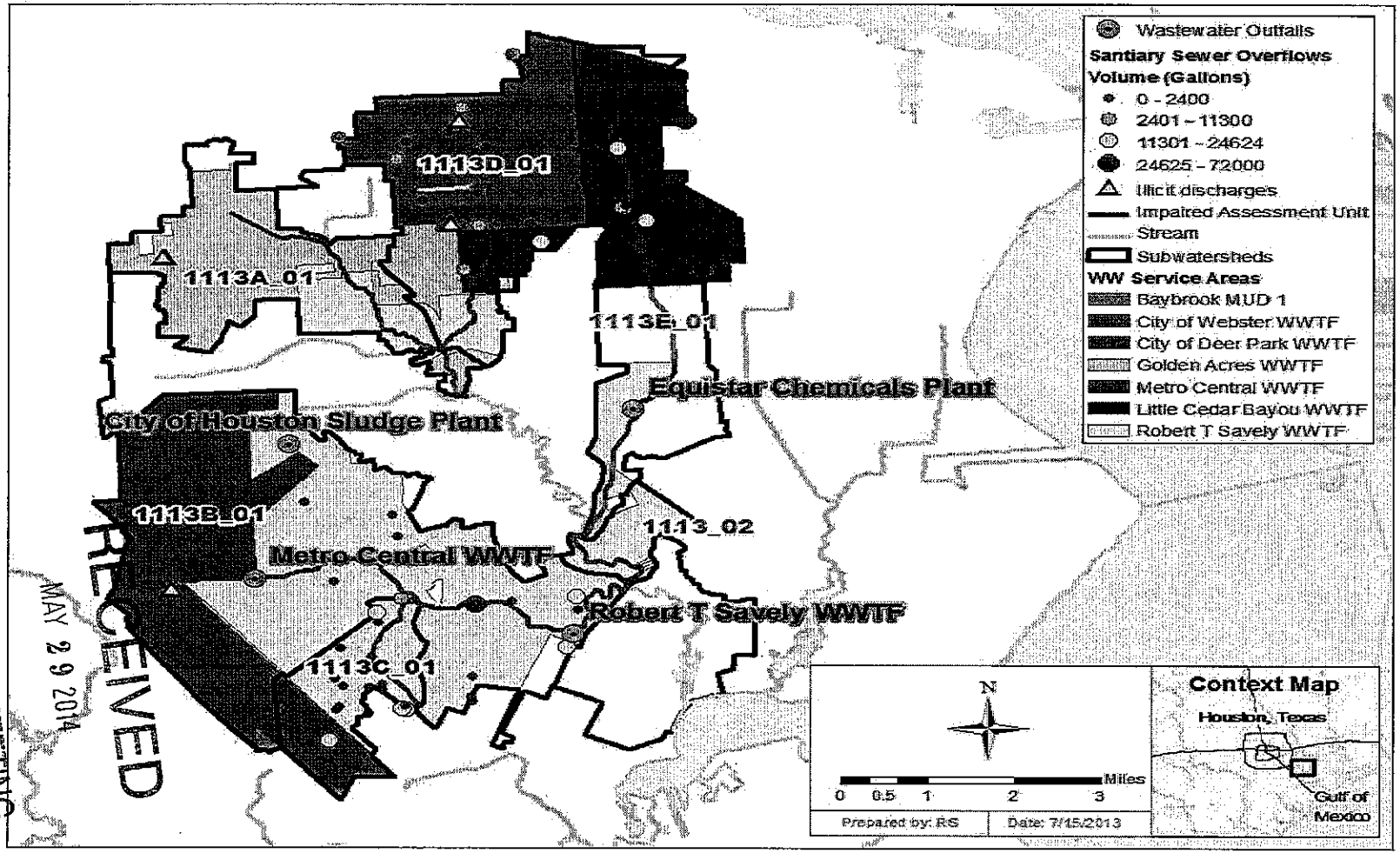

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Figure 3-2: Sanitary Sewer Overflow Locations

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3.1.3 Permitted Sources: TPDES Regulated Stormwater

In 1990, the USEPA developed rules establishing Phase I of the NPDES Stormwater Program, designed to prevent nonpoint source pollutants from being washed by stormwater runoff into municipal separate storm sewer systems and then discharged into local waterbodies (USEPA 2005). Phase I of the program required medium and large permitted dischargers (those generally serving populations of 100,000 or greater) to implement a stormwater management program as a means to control polluted discharges. Approved stormwater management programs for medium and large permitted discharges are required to address a variety of water quality-related issues, including roadway runoff management, municipal-owned operations, and hazardous waste treatment.

Phase II of the rule extended coverage of the NPDES Stormwater program in 2000 to certain small MS4s. Small MS4s are defined as any MS4 in an urbanized area as defined by the U.S. Census Bureau that was not already covered by a Phase I NPDES Stormwater Permit. The Phase II MS4 program requires operators of regulated small MS4s to obtain NPDES permits and develop a stormwater management program. Programs are designed to reduce discharges of pollutants to the "maximum extent practicable," protect water quality, and satisfy appropriate water quality requirements of the CWA. Small MS4 stormwater programs must address the following minimum control measures including Public Education and Outreach; Public Participation/Involvement; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post- Construction Runoff Control; and Pollution Prevention/Good Housekeeping.

When evaluating pollutant loads originating from stormwater runoff, a critical distinction must be made between stormwater originating from an area under an NPDES/TPDES regulated discharge permit and stormwater originating from areas not under an NPDES/TPDES regulated discharge permit. To characterize pollutant loads from stormwater runoff, it is necessary to segregate stormwater into two categories:

1) permitted stormwater, which is stormwater originating from an NPDES/TPDES-permitted Phase I or Phase II urbanized area; and
2) unregulated stormwater, which is stormwater originating from any area outside an NPDES/TPDES-permitted Phase I or Phase II urbanized area.

Within the Armand Bayou watershed, there are five individual Phase I and Phase II Ms4 programs that are currently permitted by TCEQ. These programs are operated by:

- City of Houston/Harris County (Phase I permit);
- City of Pasadena (Phase II permit);
- City of Webster (Phase II permit);
- City of Deer Park (Phase II permit); and
- City of La Porte (Phase II permit).

The coverage areas for these permits are shown in Figure 3-1. As shown in the figure, a considerable portion of the Study Area is covered under the City of Houston/Harris County MS4 permit (TPDES Permit No. WQ0004685000). The jurisdictional boundary of the Houston MS4 permit is derived from *Urbanized Area Map Results for Texas* which is based on the 2000 U.S. Census and can be found at the USEPA website http://cfpub.epa.gov/npdes/stormwater/

urbanmapresult.cfm?state=TX. Also included on Figure 3-2 are the location of illicit discharges were identified by HCFCD in the watershed (Close, 2013). Some images of illicit discharges that were identified by HCFCD are provided in Figures 3-3 to 3-6.

Shown in Table 3-5 is a summary of the individual watersheds of interest and the percentage of each watershed that is covered by one or more MS4 permits. As demonstrated in the table, all watersheds are covered by MS4 permit with the exception of Big Island Slough (assessment unit 1103E_01), which for which 93% of the watershed is covered by MS4 permits.

Table 3-5: Percentage of Permitted Stormwater in each Watershed

Segment	Receiving Stream	Regulated Entity Name	TPDES Number	Total Area (acres)	Area under MS4 Permit (Acres)	Percent of Watershed under MS4 Jurisdiction
1113_02	Armand Bayou Tidal	City of Houston/ Harris County	WQ0004685000	673	673	100%
		City of Pasadena	WQ0004524000			
1113A_01	Armand Bayou Above Tidal	City of Houston/ Harris County	WQ0004685000	3688	3688	100%
		City of Pasadena	WQ0004524000			
1113B_01	Horsepen Bayou	City of Houston/ Harris County	WQ0004685000	10668	10668	100%
		City of Pasadena	WQ0004524000			
1113C_01	Unnamed Tributary to Horsepen Bayou	City of Houston/ Harris County	WQ0004685000	1777	1777	100%
		City of Webster	RN105487318			
1113D_01	Willow Springs Bayou	City of Houston/ Harris County	WQ0004685000	4871	4871	100%
		City of Deer Park	RN105484307			
		City of La Porte	RN105510440			
		City of Pasadena	WQ0004524000			
1113E_01	Big Island Slough	City of Houston/ Harris County	WQ0004685000	5106	4770	93%
		City of La Porte	RN105510440			
		City of Pasadena	WQ0004685000			

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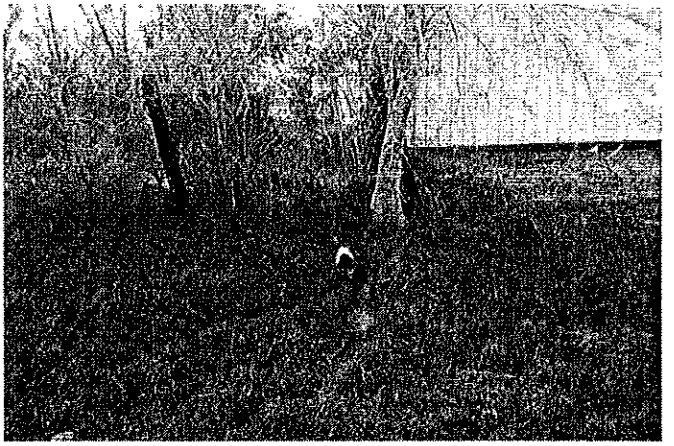

Figure 3-3: Example illicit discharge, Armand Bayou Above Tidal

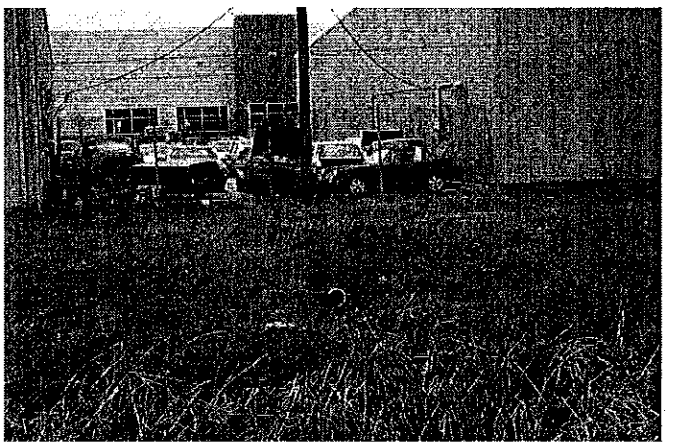

Figure 3-4: Example illicit discharge, Horsepen Bayou Tidal

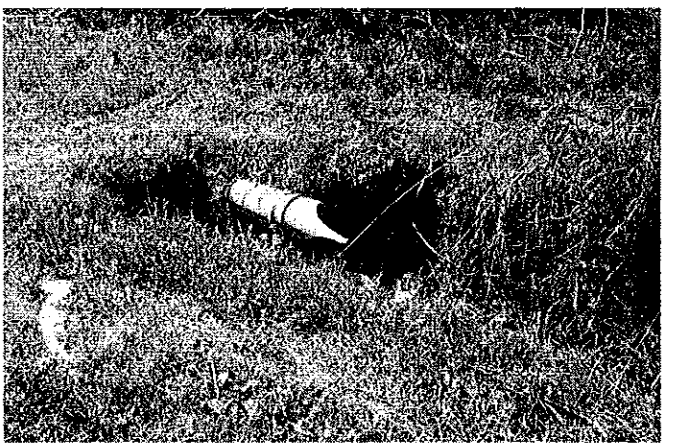

Figure 3-5: Example illicit discharge, Willow Springs Bayou

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Figure 3-6: Example illicit discharge, Big Island Slough

3.1.4 Concentrated Animal Feeding Operations

There are no CAFOs located within the Study Area.

3.2 Unregulated Sources: Stormwater, On-site Sewage Facilities, and Direct Deposition

Unregulated sources (nonpoint sources) include those sources that cannot be identified as entering the waterbody at a specific location. The following section describes possible major unregulated sources contributing bacteria loading within the Study Area.

Nonpoint sources of bacteria can emanate from wildlife, various agricultural activities, and domesticated animals, land application fields, urban runoff, failing on-site sewage facilities (OSSF), and domestic pets. Bacteria associated with urban runoff can emanate from humans, wildlife, livestock, and domestic pets. Based on the ability of warm-blooded animals to harbor and shed human pathogens, the current USEPA policy establishes the position that it is inappropriate to conclude that livestock and wildlife sources present no risk to human health from waterborne pathogens. Consequently, states and authorized tribes should not use broad exemptions from the bacteriological criteria for waters designated for primary contact recreation based on the presumption that high levels of bacteria resulting from non-human fecal contamination present no risk to human health (USEPA 2002). Water quality data collected from streams draining urban communities often show existing concentrations of fecal coliform bacteria at levels greater than a state's instantaneous standards. A study under USEPA's National Urban Runoff Project indicated that the average fecal coliform concentration from 14 watersheds in different areas within the United States was approximately 15,000 /dL in stormwater runoff (USEPA 1983). Based on data such as these, unregulated stormwater have the potential to be a significant source of fecal bacteria.

3.2.1 Wildlife and Unmanaged Animal Contributions

E coli and enterococci bacteria are common inhabitants of the intestines of all warm-blooded animals, including wildlife such as mammals and birds. In developing bacteria

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TMDLs, it is important to identify the potential for bacteria contributions from wildlife by watershed. Wildlife can be naturally attracted to riparian corridors of streams and rivers. With direct access to the stream channel, the direct deposition of wildlife waste can be a concentrated source of bacteria loading to a waterbody. *E coli* and enterococci bacteria from wildlife are also deposited onto land surfaces, where it may be washed into nearby streams by rainfall runoff. Typical of coastal watersheds, many avian species frequent the watershed and the riparian corridors, in particular; this is especially true for areas in and around the Armand Bayou Nature Center.

The significant portions of woody wetlands and undeveloped land in the Study Area also provide a habitat for many species of mammals, reptiles, and amphibians. For example, large populations of feral hogs, white tailed deer, nutria, and feral cats are of specific concern in many parts of the watershed.

There are currently insufficient data available to estimate populations and spatial distribution of wildlife and avian species by watershed. Consequently, it is difficult to assess the magnitude of bacteria contributions from wildlife species as a general category. A comprehensive species list is provided in Appendix E that includes 221 species of birds, 22 species of mammals, and 57 species of reptiles and amphibians.

3.2.2 Unregulated Agricultural Activities and Domesticated Animals

There are a number of unregulated agricultural activities that can also be sources of fecal bacteria loading. Agricultural activities of greatest concern are typically those associated with livestock operations (Drapcho and Hubbs 2002). The following are examples of livestock activities that can contribute to bacteria sources:

- Processed livestock manure is often applied to fields as fertilizer, and can contribute to fecal bacteria loading to waterbodies if washed into streams by runoff before incorporation.
- Livestock grazing in pastures deposit manure containing fecal bacteria onto land surfaces. These bacteria may be washed into waterbodies by runoff if inadequate buffers exist between pastures and waterbodies.
- Livestock may have direct access to waterbodies and can provide a concentrated source of fecal bacteria loading directly into streams.

The estimated numbers of selected livestock by watershed were calculated based on the 2007 USDA county agricultural census data (USDA 2007). The county-level estimated livestock populations were distributed among watersheds based on GIS calculations of pasture land per watershed, based on the National Land Cover Database (NOAA 2011). It should be noted that these are planning level livestock are not evenly distributed across counties or constant with time.

As shown in Table 3-6, cattle are estimated to be the most abundant species of livestock in the Study Area. Livestock numbers and their associated bacteria loading are expected to decrease over time as more land is converted from grazing to developed, urban uses in Armand Bayou watershed.

Table 3-6: Livestock and Manure Estimates by Watershed

Type of Animal	1113_02	1113A_01	1113B_01	1113C_01	1113D_01	1113E_01	Total Animals
Cattle and Calves	0	41	291	0	130	69	**531**
Horses and Ponies	0	8	53	0	24	13	**98**
Goats	0	3	21	0	10	5	**39**
Hogs and Pigs	0	1	6	0	2	1	**10**
Sheep and Lambs	0	1	6	0	3	1	**11**
Bison	0	0	0	0	0	0	**0**
Captive Deer	0	1	7	0	3	2	**13**
Donkey	0	1	4	0	2	1	**8**
Rabbits	0	1	4	0	2	1	**8**
Llamas	0	0	2	0	1	0	**3**
Pullets	0	1	4	0	2	1	**8**
Broilers	0	1	8	0	4	2	**15**
Layers	0	6	43	0	19	10	**78**
Turkeys	0	0	2	0	1	1	**4**
Ducks	0	0	4	0	2	1	**7**
Geese	0	0	2	0	1	0	**3**
Other Poultry	0	1	7	0	3	2	**13**
Total Animals	**0**	**66**	**464**	**0**	**207**	**110**	

According to a livestock study conducted by the American Society of Agricultural Engineers (ASAE) and referenced by the USEPA (2000) in their Bacteria Indicator Tool, the daily fecal coliform production rates by livestock species were estimated as follows (ASAE 1998):

- Beef cattle release approximately 1.04E+11 per animal per day
- Dairy cattle release approximately 1.01E+11 per animal per day
- Swine release approximately 1.08E+10 per animal per day
- Chickens release approximately 1.36E+08 per animal per day
- Sheep release approximately 1.20E+10 per animal per day
- Horses release approximately 4.20E+08 per animal per day
- Turkey release approximately 9.30E+07 per animal per day
- Ducks release approximately 2.43E+09 per animal per day
- Geese release approximately 4.90E+10 per animal per day

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Using the estimated livestock populations and the fecal coliform production rates from ASAE, an estimate of fecal coliform production from each group of livestock was calculated in

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Table 3-7 for each watershed of the Study Area. It should be noted that only a fraction of these fecal coliform loading estimates are expected to reach the receiving water, either washed into streams by runoff or by direct deposition from wading animals. Cattle appear to represent the most significant livestock source of fecal bacteria based on overall loading estimates.

Table 3-7: Fecal Coliform Production Estimates for Selected Livestock ($x10^9$ /day)

Stream Name	Cattle & Calves	Horses & Ponies	Sheep & Lambs	Hogs & Pigs	Ducks	Geese	Chickens	Total
Armand Bayou Tidal	2,138	2	5	4	1	6	1	2,156
Armand Bayou Above Tidal	11,717	9	28	23	3	32	3	11,816
Horsepen Bayou	33,890	25	81	67	10	93	10	34,176
Unnamed Tributary to Horsepen Bayou	5,646	4	14	11	2	16	2	5,693
Willow Springs Bayou	15,474	11	37	30	4	43	4	15,604
Big Island Slough	16,222	12	39	32	5	45	5	16,359

3.2.3 Failing On-site Sewage Facilities

On-site sewage facilities (OSSFs) can be a source of bacteria loading to streams and rivers. Bacteria loading from failing OSSFs can be transported to streams in a variety of ways, including runoff from surface ponding or through groundwater. Indicator bacteria-contaminated groundwater can also be discharged to creeks through springs and seeps.

Over time, most OSSFs operating at full capacity will fail if not properly maintained. OSSF failures are proportional to the adequacy of a state's minimum design criteria (Hall 2002). The 1995 American Housing Survey conducted by the U.S. Census Bureau estimates that, nationwide, 10 percent of occupied homes with OSSFs experience malfunctions during the year (U.S. Census Bureau 1995). A statewide study conducted by Reed, Stowe & Yanke, LLC (2001) reported that approximately 12 percent of the OSSFs in Harris County were chronically malfunctioning. Most studies estimate that the minimum lot size necessary to ensure against contamination is roughly one-half to one acre (Hall 2002). Some studies, however, found that lot sizes in this range or even larger could still cause contamination of ground or surface water (University of Florida 1987). It is estimated that areas with more than 40 OSSFs per square mile (6.25 septic systems per 100 acres) can be considered to have potential contamination problems (Canter and Knox 1985).

Only permitted OSSF systems are recorded by authorized county or city agents; therefore, it is difficult to estimate the exact number of OSSFs in use in the Study Area. Table 3-8 lists the OSSF totals based on GIS data information provided by H-GAC. Figure 3-3 displays unsewered areas that do not fall under the wastewater service areas and may be expected to have septic systems serving households in these areas.

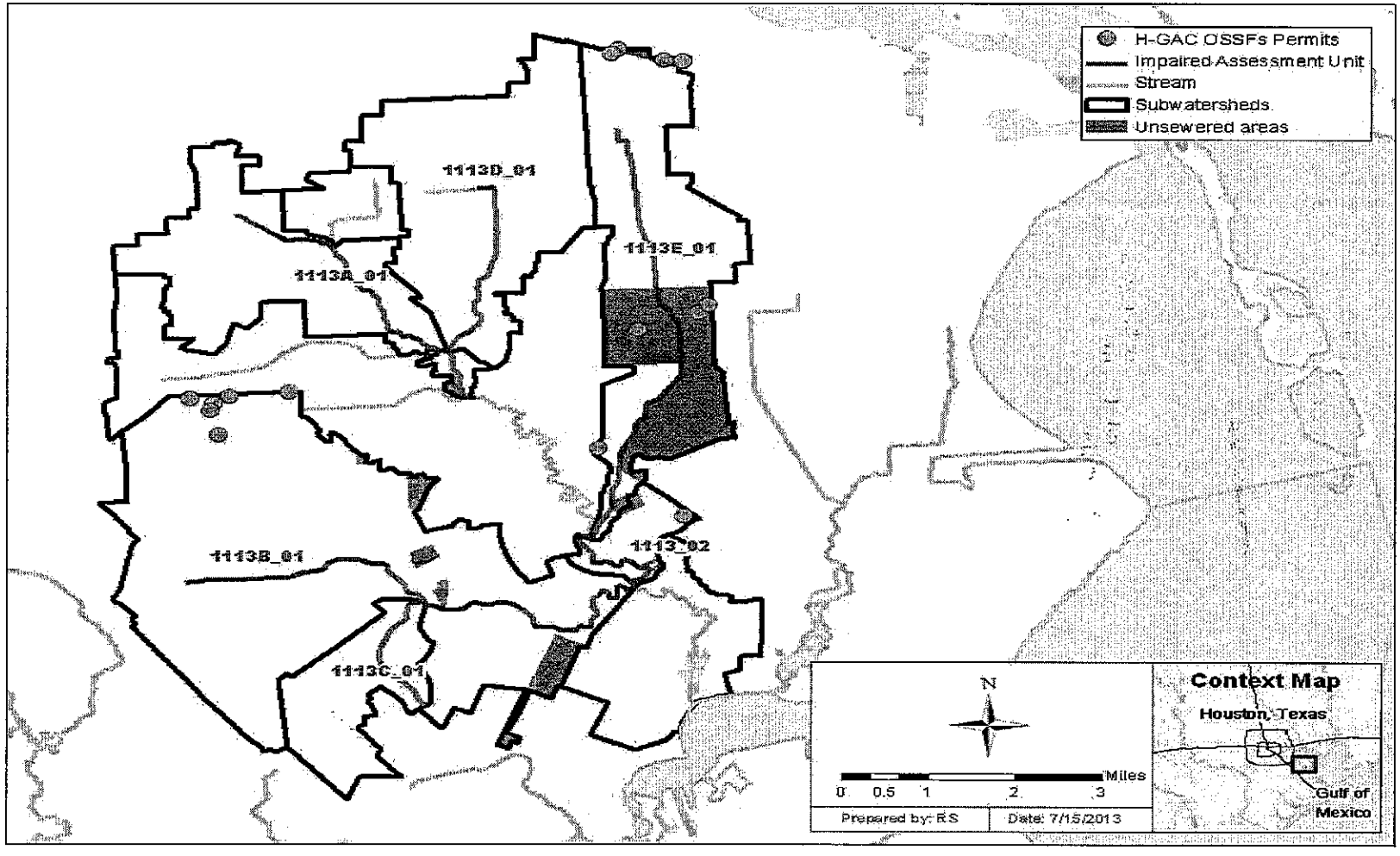

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Figure 3-7: Unsewered Areas and Subdivisions with OSSF

For the purpose of estimating fecal coliform loading in watersheds, the OSSF failure rate of 12 percent from the Reed, Stowe & Yanke, LLC (2001) report for Texas Region 4 was used. Using this 12 percent failure rate, calculations were made to characterize fecal coliform loads in each watershed.

Fecal coliform loads were estimated using the following equation (USEPA 2001):

$$\#\frac{counts}{day} = \left(\#\,Failing\_systems\right)\times\left(\frac{10^6\,counts}{100ml}\right)\times\left(\frac{70gal}{personday}\right)\times\left(\#\frac{person}{household}\right)\times\left(3785.2\frac{ml}{gal}\right)$$

The average of number of people per household was calculated to be 2.77 for the Study Area (U.S. Census Bureau 2010) based on an average household density for Houston, La Porte, Deer Park, Pasadena. Approximately 70 gallons of wastewater were estimated to be produced on average per person per day (Metcalf and Eddy 1991). The fecal coliform concentration in failing septic tank effluent was estimated to be 10^6 per 100 mL of effluent based on reported concentrations from a number of published reports (Metcalf and Eddy 1991; Canter and Knox 1985; Cogger and Carlile 1984). Using this information, the estimated load from failing septic systems within each subwatershed was calculated and is summarized in Table 3-8. Based on this data, it was determined that the estimated fecal coliform loading from OSSFs in the Study Area were found to be negligible.

Table 3-8: Estimated Number of OSSFs per Watershed and Fecal Coliform Load

Segment	Stream Name	OSSF data from H-GAC	# of Failing OSSFs	Estimated Loads from OSSFs (x 10^9 counts/day)
1113_02	Armand Bayou Tidal	1	0.12	0.88
1113A_01	Armand Bayou Above Tidal	0	0	0
1113B_01	Horsepen Bayou	9	1.08	7.94
1113C_01	Unnamed Tributary to Horsepen Bayou	0	0	0
1113D_01	Willow Springs Bayou	0	0	0
1113E_01	Big Island Slough	10	1.2	8.82

3.2.4 Domestic Pets

Fecal matter from dogs and cats is transported to streams by runoff from urban and suburban areas and can be a potential source of bacteria loading. On average nationally, there are 0.58 dogs per household and 0.66 cats per household (American Veterinary Medical Association 2002). Using the U.S. Census data at the block level (U.S. Census Bureau 2010), dog and cat populations can be estimated for each watershed. Table 3-9 summarizes the estimated number of dogs and cats for the watersheds of the Study Area.

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Table 3-9: Estimated Numbers of Pets

Segment	Stream Name	Dogs	Cats
1113_02	Armand Bayou Tidal	120	137
1113A_01	Armand Bayou Above Tidal	3,061	3,483
1113B_01	Horsepen Bayou	6,424	7,310
1113C_01	Unnamed Tributary to Horsepen Bayou	4,664	5,307
1113D_01	Willow Springs Bayou	4,735	5,388
1113E_01	Big Island Slough	3,003	3,417

Table 3-10 provides an estimate of the fecal coliform load from pets. These estimates are based on estimated fecal coliform production rates of $5.4x10^8$ per day for cats and $3.3x10^9$ per day for dogs (Schueler 2000). Only a small portion of these loads is expected to reach waterbodies, through wash-off of land surfaces and conveyance in runoff.

Table 3-10: Fecal Coliform Daily Production by Pets (x 10^9)

Segment	Stream Name	Dogs	Cats	Total Load (cfu/day x 10^9)
1113_02	Armand Bayou Tidal	396	74	470
1113A_01	Armand Bayou Above Tidal	10,101	1,881	11,982
1113B_01	Horsepen Bayou	21,200	3,948	25,148
1113C_01	Unnamed Tributary to Horsepen Bayou	15,391	2,866	18,257
1113D_01	Willow Springs Bayou	15,624	2,909	18,533
1113E_01	Big Island Slough	9,909	1,845	11,754

3.2.5 Bacteria Re-growth and Die-off

Bacteria are living organisms that grow and die. Certain enteric bacteria can regrow in organic materials if appropriate conditions prevail (*e.g.*, warm temperature). It has been shown that fecal organisms can regrow from improperly treated effluent during their transport in pipe networks, and they can regrow in organic rich materials such as compost and sludges. While the die-off of indicator bacteria has been demonstrated in natural water systems due to the presence of sunlight and predators, the potential for their regrowth is less well understood. Both processes (regrowth and die-off) are in-stream processes and are not considered in the bacteria source loading estimates of each water body.

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CHAPTER 4
TECHNICAL APPROACH AND METHODS

The TMDL represents the maximum amount of a pollutant that the stream can receive in a single day without exceeding the water quality standard. A TMDL is expressed as the sum of three elements as described in the following mathematical equation:

$$TMDL = \Sigma WLA + \Sigma LA + MOS$$

The wasteload allocation (WLA) is the portion of the TMDL allocated to existing and future permitted (point) sources. The load allocation (LA) is the portion of the TMDL allocated to unregulated (nonpoint) sources, including natural background sources. The MOS is intended to account for uncertainty and ensure that standard for contact recreation will be met. Thus, the allowable pollutant load that can be allocated to point and nonpoint sources can then be defined as the TMDL minus the MOS.

40 CFR §130.2(1), states that TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measures. For *E coli* or enterococci bacteria, TMDLs are expressed as numbers per day, where possible, or as a percent reduction goal, and represent the maximum one day load the stream can assimilate while still attaining the standard for contact recreation. For the Armand Bayou Watershed, to quantify allowable pollutant loads, percent reduction goals to achieve standard for contact recreation, and specific TMDL allocations for point and nonpoint sources, two different methods are used: 1) the load duration curve method for non-tidal streams and 2) a mass balance method using a tidal prism for tidal streams. These two different technical approaches are described in this Section.

4.1 Using Load Duration Curves to Develop TMDLs

The TMDL calculations for freshwater streams presented in this report are derived from LDCs. LDCs facilitate development of TMDLs, and as a TMDL development tool, can be effective at identifying whether impairments are associated with point or nonpoint sources. The technical approach for using LDCs for TMDL development includes the four following steps described in Subsections 4.2 through 4.4 below:

1. Preparing flow duration curves (FDC) for gaged and ungaged WQM stations;
2. Estimating existing bacteria loading in the receiving water using ambient water quality data;
3. Using LDCs to identify the critical condition that will dictate loading reductions necessary to attain the contact recreation standard; and
4. Interpreting LDCs to derive TMDL elements – WLA, LA, MOS, and percent reduction goal.

Historically, in developing WLAs for pollutants from point sources, it was customary to designate a critical low flow condition (*e.g.*, 7Q2) at which the maximum permissible loading was calculated. As water quality management efforts expanded in scope to quantitatively address nonpoint sources of pollution and types of pollutants, it became clear that this single critical low flow condition was inadequate to ensure suitable water quality across a range of flow conditions. Because the LDC covers a range of flow conditions, use of the LDC obviates

the need to determine a design storm or selected flow recurrence interval with which to characterize the appropriate flow level for the assessment of critical conditions. For waterbodies impacted by both point and nonpoint sources, the "nonpoint source critical condition" would typically occur during high flows, when rainfall runoff would contribute the bulk of the pollutant load, while the "point source critical condition" would typically occur during low flows, when WWTF effluent would dominate the base flow of the impaired water.

LDCs display the maximum allowable load over the complete range of flow conditions by a line using the calculation of flow multiplied by the water quality criterion. Using LDCs, a TMDL can be expressed as a continuous function of flow, or as a discrete value derived from a specific flow condition.

4.2 Development of Flow Duration Curves

Flow duration curves serve as the foundation of LDCs and are graphical representations of the flow characteristics of a stream at a given site. When historical flow data are available, FDCs utilize the hydrologic record from stream gages to forecast future recurrence frequencies. While many WQM stations throughout Texas do not have long term flow data, there are various methods that can be used to estimate flow frequencies at ungaged stations or gaged stations missing flow data.

The most basic method to estimate flows at an ungaged site involves 1) identifying an upstream or downstream flow gage; 2) calculating the contributing drainage areas of the ungaged sites and the flow gage; and 3) calculating daily flows at the ungaged site by using the flow from an acceptable nearby gaged site multiplied by the drainage area ratio. Because no upstream/downstream gages were located on Armand Bayou, a more complex approach was used that correlates nearby gages and also considers watershed differences in pervious and impervious cover, land cover, WWTF discharges, and the hydrologic properties of the watershed. A more detailed explanation of the methods for estimating flow at ungaged WQM stations is provided in Appendix F.

Flow duration curves are a type of cumulative distribution function. The flow duration curve represents the fraction of flow observations that exceed a given flow at the site of interest. The observed flow values are first ranked from highest to lowest then, for each observation, the percentage of observations exceeding that flow is calculated. The flow value is read from the y-axis, which is typically on a logarithmic scale since the high flows would otherwise overwhelm the low flows. The flow exceedance frequency is read from the x-axis, which is numbered from 0 to 100 percent, and may or may not be logarithmic. The lowest measured flow occurs at an exceedance frequency of 100 percent indicating that flow has equaled or exceeded this value 100 percent of the time, while the highest measured flow is found at an exceedance frequency of 0 percent. The median flow occurs at a flow exceedance frequency of 50 percent.

While the number of observations required to develop a flow duration curve is not rigorously specified, a flow duration curve is usually based on more than 5-years of observations, and encompasses inter-annual and seasonal variation. Ideally, the drought of record and flood of record are included in the observations. For this purpose, the long-term flow gaging stations operated by the USGS are utilized. As previously mentioned, there are no

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long-term flow data from within the Study Area and therefore, flows were estimated for all WQM stations/watersheds in Armand Bayou using the gage correlation approach described in Appendix F. Two USGS gages outside the watershed, Sims Bayou at Hiram Clarke Street and Vince Bayou at Pasadena, TX, were chosen to conduct flow projections. The period of record for flow data used from this station was 2000 through 2013.

A typical semi-log flow duration curve exhibits a sigmoidal shape, bending upward near a flow exceedance frequency value of 0 percent and downward at a frequency near 100 percent, often with a relatively constant slope in between. For sites that on occasion exhibit no flow, the curve will intersect the abscissa at a frequency less than 100 percent. As the number of observations at a site increases, the line of the FDC tends to appear smoother. However, at extreme low and high flow values, flow duration curves may exhibit a "stair step" effect due to the USGS flow data rounding conventions near the limits of quantitation.

FDCs can be subdivided into hydrologic condition classes to facilitate the diagnostic and analytical uses of flow and LDCs. The hydrologic classification scheme utilized in this application is described in Table 4-1.

Table 4-1: Hydrologic Classification Scheme

Flow Exceedance Percentile	Hydrologic Condition Class
0-20	Highest flows
20-80	Mid-range flows
80-100	Lowest flows

Figures 4-1 through 4-4 presents the FDC developed for the downstream WQM station in Armand Bayou Above Tidal (Figure 4-1); Unnamed Tributary to Horsepen Bayou (Figure 4-2); Willow Springs Bayou (Figure 4-3) and Big Island Slough (Figure 4-4) for calculating the TMDL of the 303(d) listed freshwater stream using the gage correlation method outlined above and further described in Appendix F. The flow exceedance percentiles for these segments are presented in tabular form in Appendix F.

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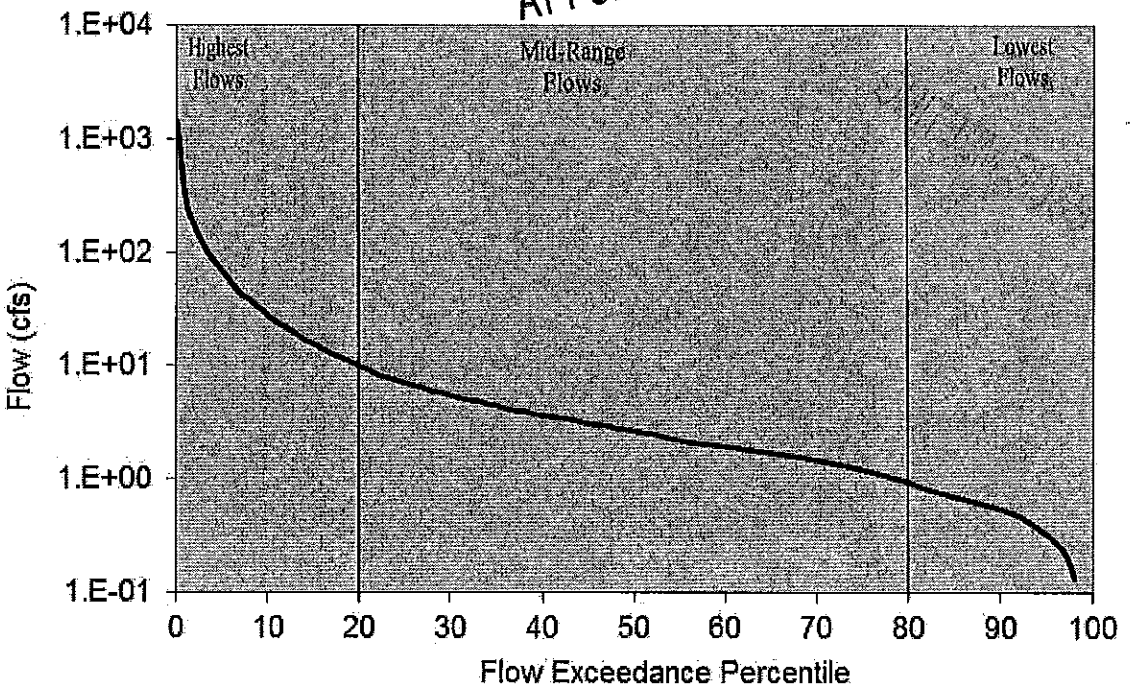

Figure 4-1: Flow Duration Curve for Armand Bayou Above Tidal (1113A_01)

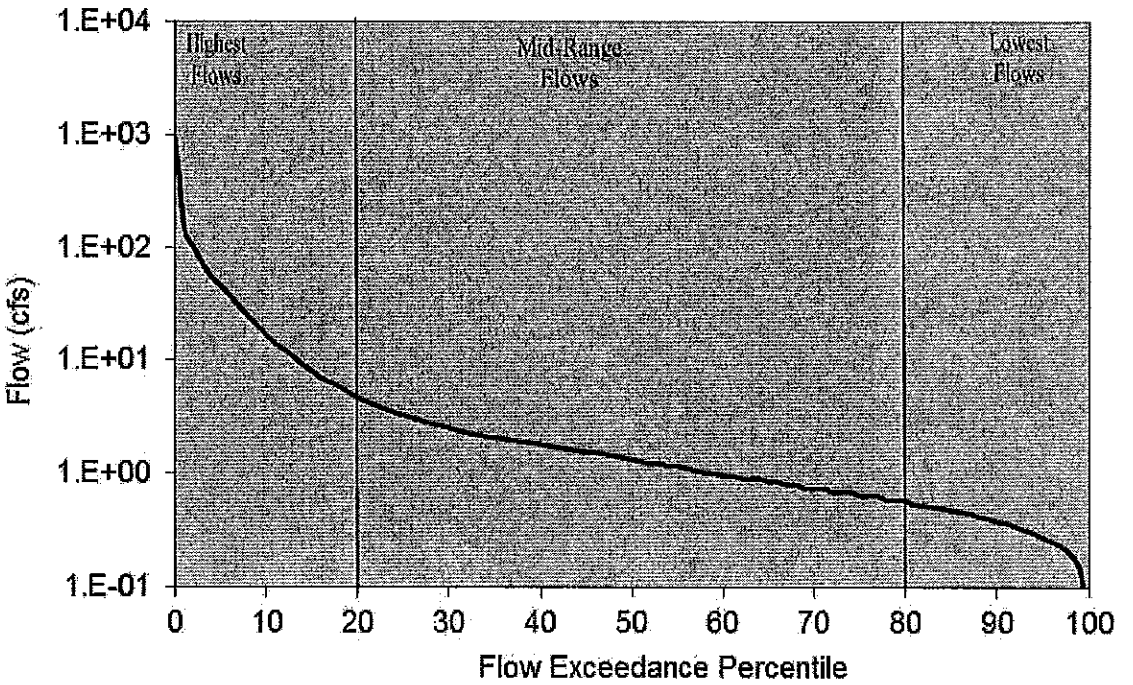

Figure 4-2: Flow Duration Curve for Unnamed Tributary to Horsepen Bayou (1113C_01)

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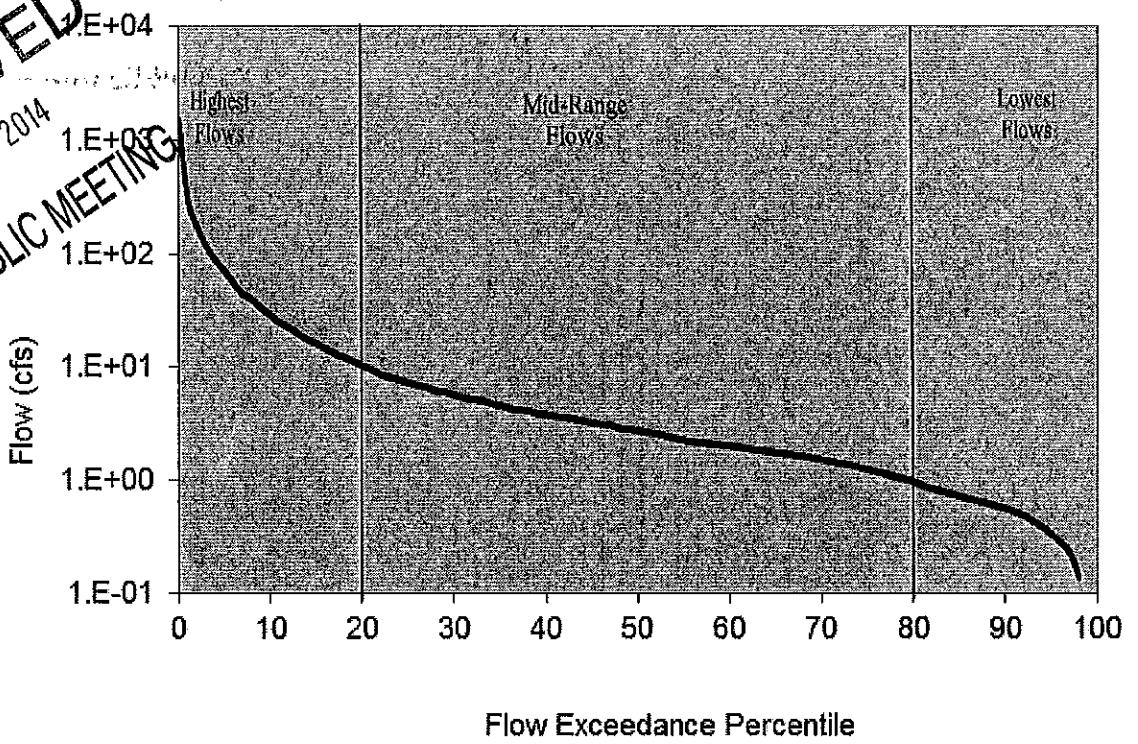

Figure 4-3: Flow Duration Curve for Willow Springs Bayou (1113D_01)

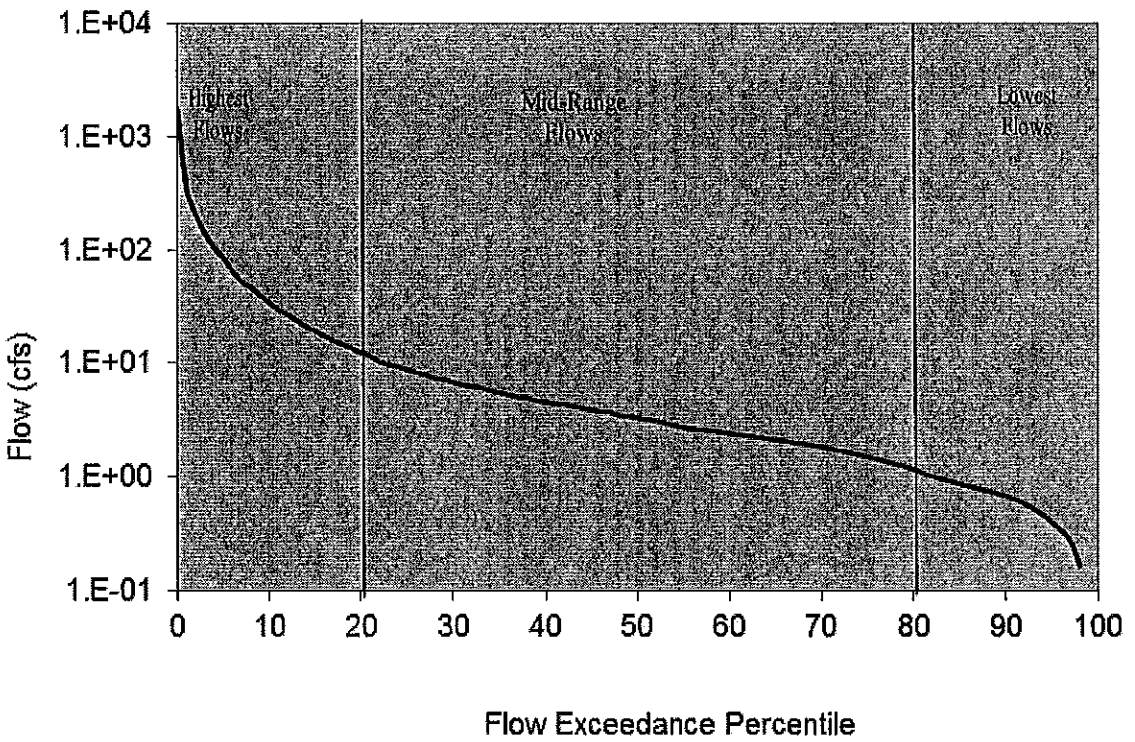

Figure 4-4: Flow Duration Curve for Big Island Slough (1113E_01)

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4.3 Estimating Current Point and Nonpoint Loading and Identifying Critical Conditions from Load Duration Curves

Another key step in the use of LDCs for TMDL development is the estimation of existing bacteria loading from point and nonpoint sources and the display of this loading in relation to the TMDL. There were no domestic or otherwise continuously discharging point sources (i.e., WWTFs) in the above tidal watersheds. Therefore, the TMDL was allocated between stromwater wasteload allocation and the load allocation based on the percentage of the watershed covered by MS4 permits

The critical condition for the load duration curve is considered the flow regime that requires the most significant bacteria reduction to meet water quality standards. For all watersheds of interest, this was the high flow (0-20th percentile flow) conditions.

4.4 Development of Bacteria TMDLs for Freshwater Streams Using Load Duration Curves

The final step of the process involves developing calculations to support development of the TMDL allocations.

Step 1: Generate Bacteria LDCs. LDCs are similar in appearance to flow duration curves; however, the ordinate is expressed in terms of a bacteria load in counts/day. The curve represents the water quality criteria for *E coli* (either single sample criteria of 394 MPN/dL or geometric mean criteria of 126 MPN/dL), expressed in terms of a load through multiplication by the continuum of flows at the site determined using the gage correlation approach. The basic steps to generating an LDC involve:

- develop flow estimates using the gage correlation approach described in Appendix F and develop flow duration curve as described in previous sections;
- obtaining the water quality data for the WQM station;
- matching the water quality observations with the flow estimates from the same date;
- display a curve on a plot that represents the allowable load multiply the actual or estimated flow by the surface water quality standard for each respective indicator;
- multiplying the flow by the water quality parameter concentration to calculate daily loads; then
- plotting the flow exceedance percentiles and the daily observed bacteria load .

The culmination of these steps is expressed in the following formula, which is displayed on the LDC as the TMDL curve:

*TMDL (counts/day) = criterion * flow (cfs) * unit conversion factor*

Where: criterion = 399 counts/dL (E coli) and

*unit conversion factor = 24,465,755 dL/ft3 * seconds/day*

The flow exceedance frequency (x-value of each point) is obtained by looking up the historical exceedance frequency of the measured or estimated flow; in other words, the percent of historical observations that equal or exceed the measured or estimated flow. Historical observations of bacteria concentration are paired with flow data and are plotted on the LDC.

The indicator bacteria load (or the y-value of each point) is calculated by multiplying the indicator bacteria concentration (counts/dL) by the instantaneous flow (cubic feet per second [cfs]) at the same site and time, with appropriate volumetric and time unit conversions. Indicator bacteria loads representing exceedance of water quality criterion fall above the water quality criterion line.

Figure 4-5 provides a schematic representation of where permitted and unregulated sources of pollution occur throughout the entire hydrograph for a typical stream. This figure shows that runoff typically contributes pollutant loads during high flow to mid-ranged flow conditions. However, flows do not always correspond directly to runoff events. For instance, high flows may occur in dry weather and runoff influence may be observed with low or moderate flows.

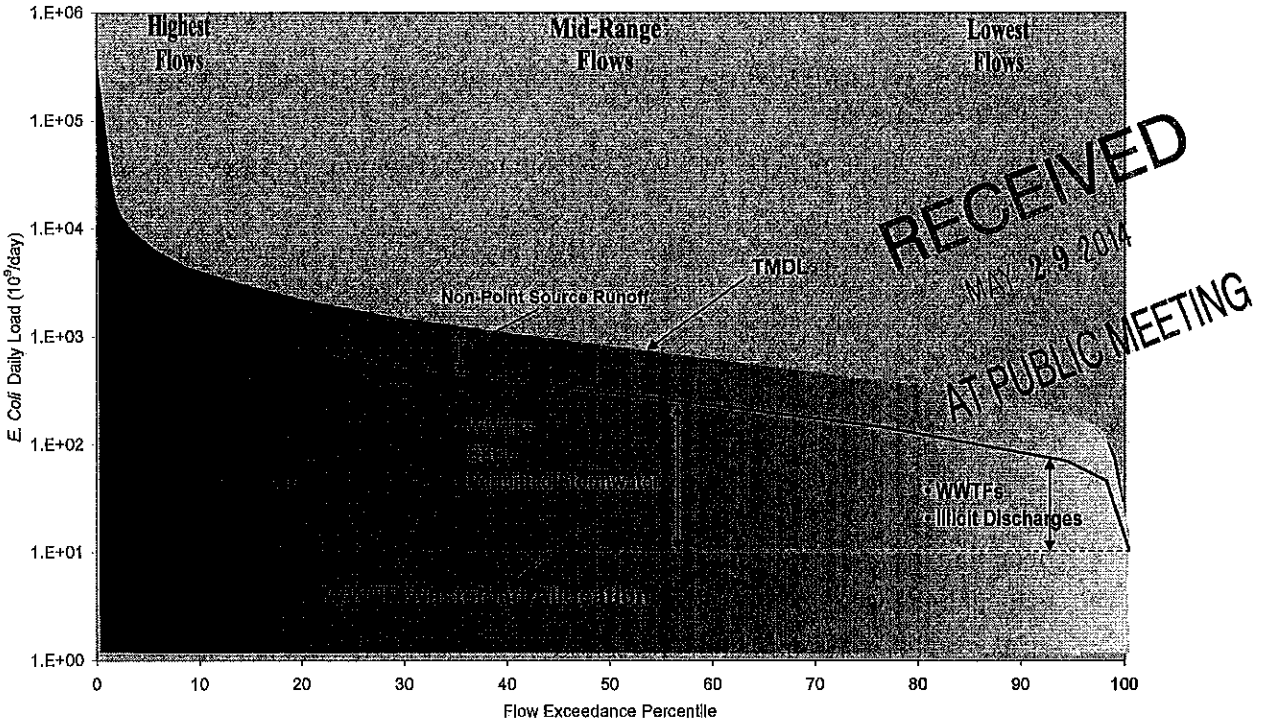

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Figure 4-5: Schematic Diagram – Interpreting Sources and Loads

Step 2: Develop LDCs with MOS. The MOS may be defined explicitly or implicitly. An LDC depicting slightly lower estimates than the TMDL is typically developed to incorporate an MOS into the TMDL calculations. A typical explicit approach would reserve some fraction of the TMDL (*e.g.,* 5%) as the MOS. For the TMDLs for freshwater streams in this report, an explicit MOS of 5 percent of the TMDL value (5% of the geometric mean water quality criterion) has been selected. The MOS at any given percent flow exceedance, therefore, is defined as the difference in loading between the TMDL and the TMDL with MOS.

Step 3: Calculate WLA. As previously stated, the pollutant load allocation for permitted (point) sources is defined by the WLA. A point source can be either a wastewater or stormwater permitted discharge. Stormwater point sources are typically associated with urban

and industrialized areas, and recent USEPA guidance includes NPDES-permitted stormwater discharges as point source discharges and, therefore, part of the WLA.

The LDC approach recognizes that the assimilative capacity of a waterbody depends on the flow, and that maximum allowable loading will vary with flow condition. TMDLs can be expressed in terms of maximum allowable concentrations, or as different maximum loads allowable under different flow conditions, rather than single maximum load values. This concentration-based approach meets the requirements of 40 CFR, 130.2(i) for expressing TMDLs "in terms of mass per time, toxicity, or other appropriate measures" and is consistent with USEPA's Protocol for Developing Pathogen TMDLs (USEPA 2001).

WLA for WWTF. WLAs may be set to zero for watersheds with no existing or planned permitted point sources. For watersheds with permitted point sources, WLAs may be derived from TPDES permit limits. In this report, there were no WWTFs in the freshwater segments. Therefore, no WLAs were established for WWTFs.

WLA for NPDES/TPDES MS4s. Given the lack of data and the complexity of quantifying bacteria concentrations or loads associated with wet weather events, the percentage of a watershed that is under MS4 jurisdiction is used to estimate the load that should be allocated as the permitted stormwater load. For example, the area of the City of Houston/Harris County and City of Pasadena permitted MS4 discharges in the project area is estimated to be 10,668 acres, 100 percent of the Horsepen Bayou (Segment 1113B_01) watershed. Therefore, 100 percent of the wasteload allocation will be designated as the WLA for stormwater.

Step 4: Calculate LA. LAs for unregulated sources (nonpoint sources) can be calculated under different flow conditions as the water quality target load minus the sum of WLA for WWTFs (if any) and permitted stormwater (or MS4). The LA at any particular flow exceedance is calculated as shown in the equation below.

$$LA = TMDL - MOS - \Sigma WLA_{WWTF} - \Sigma WLA_{MS4}$$

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Where:

LA = allowable load from unregulated sources
TMDL= total allowable load
ΣWLA_{WWTF} = sum of all WWTF loads
ΣWLA_{MS4} = sum of all MS4 loads
MOS = margin of safety

Step 5: Estimate WLA Load Reduction. If there were WWTFs in the segments of interest for this report, the WLA load reduction for TPDES-permitted WWTFs would not be calculated. Instead, it would be assumed that continuous dischargers are adequately regulated under existing permits and, therefore, no WLA reduction would be required. However, for permitted stormwater the load reduction will be the same as the percent reduction goal established for the LA (nonpoint sources).

Step 6: Estimate LA Load Reduction. A percent reduction goal is derived for each WQM station on each segment for the geometric mean criterion. The goal is determined by comparing the TMDL for each of the three flow regimes with the observed geometric mean load for the flow regime.

Percent Reduction Goal = ABS(Geometric Mean of Indicator Bacteria Load – TMDL) / Geometric Mean of Indicator Bacteria Load

4.5 Development of Bacteria TMDLs for Tidal Streams Using a Mass Balance Approach

4.5.1 Modeling Approach

A time-variable tidal prism modeling approach with a moderate level of spatial resolution was used to simulate the bacterial indicator loads and establish TMDLs for the tidal segments of the Study Area. The tidal prism is the volume of water gained in a tidal stream between low and high tide levels. In addition, the model included from 1/1/2010 to 12/31/2012. Load calculations were developed for a series of reaches within Armand Bayou Tidal as well as the portions of the major tributaries discharging to Armand Bayou Tidal that periodically are influenced by tidal fluctuations. The model incorporates the three primary mechanisms through which Enterococci loadings and water enter the impaired systems: i) rain-induced freshwater inputs via tributaries or direct runoff, ii) direct point source discharges, and iii) tidally influenced loadings, which are introduced during the diurnal tidal fluctuations that occur in the system. The model assumes that Enterococci are removed with the net estuarine flow from the system and via net decay. A generalized schematic of the source and sink terms for the tidally influenced impaired waterbodies is presented in Figure 4-3.

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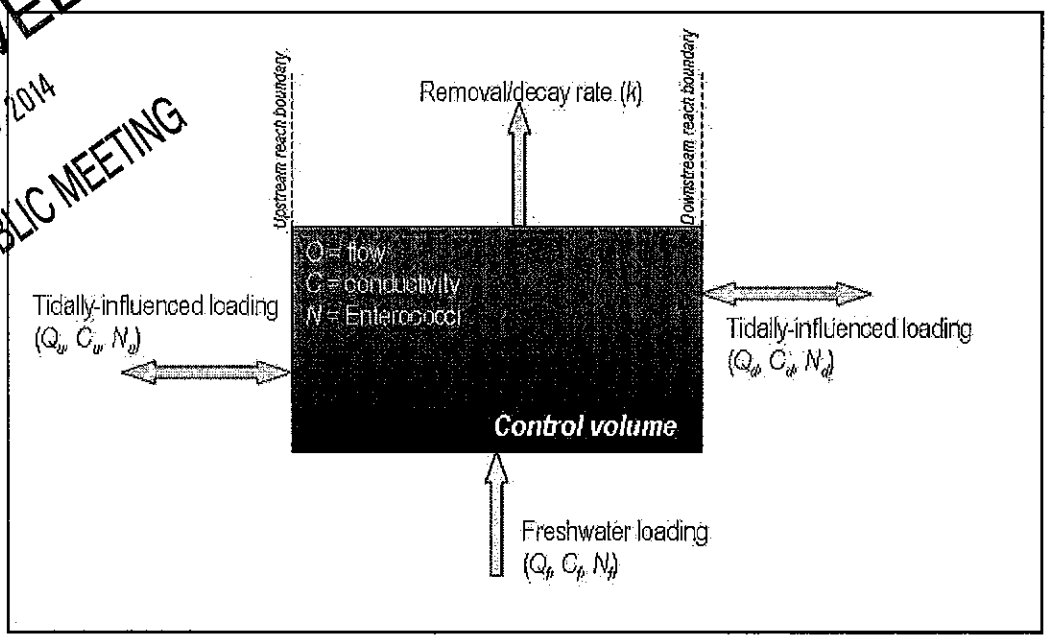

Figure 4-3 Conceptual Model for Sources and Sinks of Enterococci

The mass balance of water for a given reach at a given time step can be written as follows:

$$\frac{dV}{dt} = Q_u + Q_f - Q_d \quad (1)$$

Where: Q_u = volume of water crossing the upstream boundary of the reach [m^3/hr]

Q_d = volume of mixed water crossing the downstream boundary of the reach [m^3/hr]

Q_f = volume of freshwater inflow (runoff, tributaries, and WWTFs) discharging along the reach [m^3/hr],

dV/dt = change in volume of the reach with time [m^3/hr]

The following paragraphs summarize the steps that were followed to complete the tidal prism model.

Step 1: Define Reaches.

Tidal, Segment 1113_02, was kept as one reach due to its small size and Horsepen Bayou, Segment 1113B was divided into five reaches (Figure 4-4). The tidal prism model includes tributaries discharging to Armand or Horsepen Bayous including Big Island Slough, Armand Bayou Above Tidal, Willow Springs Bayou, and Unnamed Tributary to Horsepen Bayou

Data from TSARP models were used to calculate cross-sectional areas for the boundaries of each main stem reach. Cross-sectional areas for small tributaries were estimated using DEM (Digital Elevation Model) profile graphspublished in 2009 provided by USGS. Cross-section data for the two streams included in the Study Area are provided in electronic format in Appendix G..

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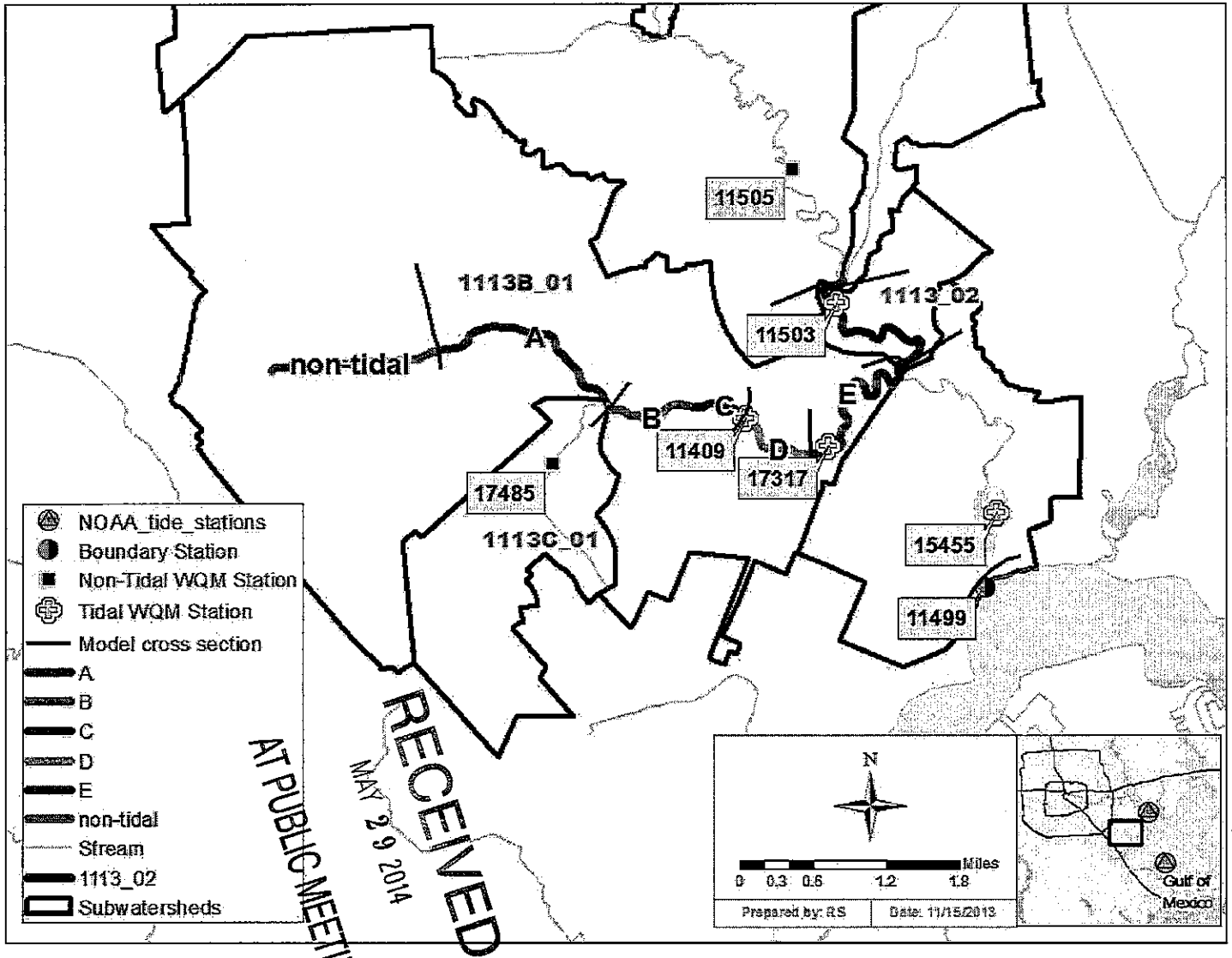

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Figure 4-4 Schematic of the Modified Tidal Prism Model

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Step 2: Establishing Tributary Inflows and Loads

The model requires time series for inflow and bacterial indicator loads from the freshwater tributaries (the model headwaters) discharging to the tidal portions. The methods for estimating these headwater boundary flows and Enterococci loads are summarized in this step.

Inflows from Non-Tidal Tributaries to Tidal Model Reaches

Estimated daily inflows from non-tidal (freshwater) tributary streams to the tidal model reaches were derived from the drainage area ratio method described in Appendix F. These daily inflows were then disaggregated to hourly time series for the modeled period (2010 through 2012), and provided in Appendix H in electronic format.

Enterococci Loads from Upstream Freshwater Segments

Indicator bacteria concentrations measured at the most downstream WQM stations on non-tidal tributaries, including Unnamed Tributary to Horsepen Bayou (17485) and Armand Bayou (11505) were used to estimate Enterococci loads to the tidal prism model. For most of the WQM stations on these tributaries, only *E. coli* or fecal coliform data were available. Therefore, Enterococci concentrations were estimated from *E. coli* or fecal coliform data using Enterococci/*E. coli* (ENT/EC) or Enterococci/fecal coliform (ENT/FC) conversion ratios, based on data collected by the City of Houston and H-GAC for their Alternate Indicator Study (Running 2007). The median ENT/EC and ENT/FC ratios were 0.34 and 0.27, respectively. For dates with no historical water quality data available, the geometric mean of the observed values of each respective station was used. For tributaries with no WQM stations, Enterococci loads estimated from the ratio of event mean concentrations (EMC) of tributaries with WQM stations. Tributary load input datasets for Enterococci are included in electronic format in Appendix H and summarized in Table 4-2.

Table 4-2 Summary of Tributary Inflows and Loads to the Tidal Prism Model

Interface	Average Flow (m^3/day)	Average Flow (cfs)	Average Enterococci Load (counts/day)
Armand Bayou Above Tidal	1.12E+04	4.58E+00	8.77E+08
Tributary 1 (to Reach A)	4.98E+03	2.04E+00	2.57E+09
Tributary 2 (to Reach B)	2.85E+03	1.17E+00	2.09E+09
Tributary 3 (to Reach C)	1.47E+03	6.02E-01	1.08E+09
Tributary 4 (to Reach C)	1.82E+03	7.43E-01	1.32E+09

Step 3: Estimating Direct (non-tributary) Point and Nonpoint Source InFlows and Loading to the System.

The key variables required for estimating loading into the model reaches are direct runoff to the tidal streams modeled, WWTF discharges to the various reaches, and indicator bacteria concentrations in runoff and WWTF effluents. The methods for estimating these tidal prism inputs are summarized below.

Permitted Sources: Continuous Point Source Dischargers (WWTFs)

Two TPDES-permitted WWTFs that continuously discharge wastewater are located in the Horsepen Bayou Watershed. To be consistent with estimating bacterial indicator loads under the LDC method, average monthly flows from DMRs were again used to estimate fecal coliform and Enterococci loads from discrete point sources as inputs to the tidal prism model. Loads were calculated using maximum monthly geometric mean data for Enterococci when available from TCEQ, and converted from fecal coliform to Enterococci loads using the 0.27 ENT/FC ratio). Since no bacteria data were available for facility 10495-152, Enterococci loads were calculated from the ratio of permitted flow from facility 10539-001. A summary of these data are shown in Table 4-3.

Table 4-3 Summary of Existing WWTF Loads in Model

Model Reach	TPDES Permit Number	Flow (average self-reported) m^3/hr	Flow (average self-reported) MGD	Enterococci Concentration (counts/dL)	Enterococci Load (counts/day)
A	10495-152	5.06E+03	1.44	13[b]	6.0E+08
E	10539-001	1.99E+04	5.58	25[a]	5.0E+09

[a] *Maximum value of monthly self-reported geomeans (estimated from 0.27 ENT/FC ratio before 11/20/2009)*
[b] *Estimated from facility 10539-001*

Permitted and Unregulated Stormwater Runoff

Runoff from each of the watersheds was defined using the Harris County Flood Control District (HCFCD) Hydrologyic Modeling System (HMS) flow simulation model. The HCFCD model was updated to include hourly rainfall from HCOEM Rainfall Gage 250 located at the downstream boundary of 1113B Horsepen Bayou Reach C.

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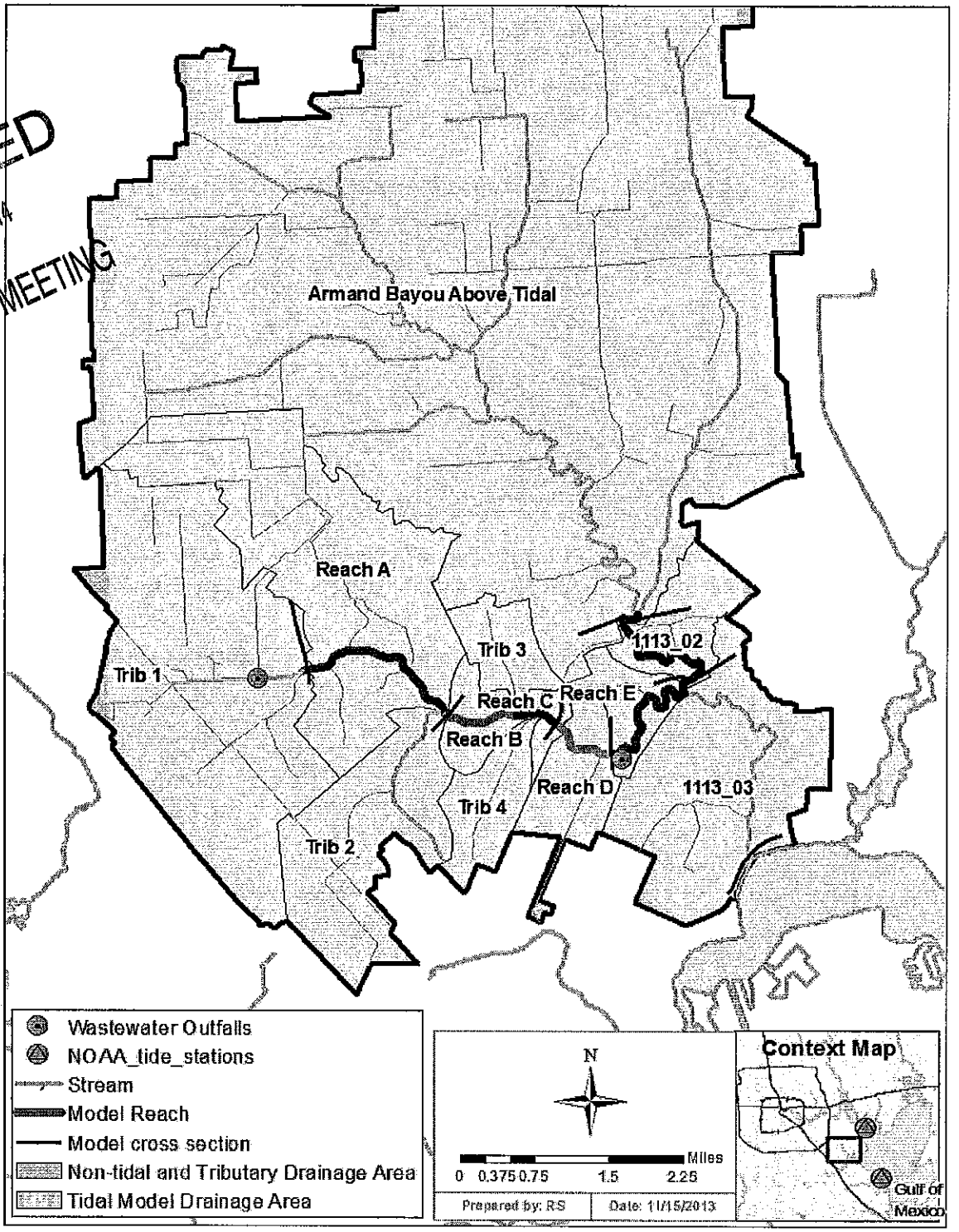

Figure 4-5 Drainage Areas for the Tidal Prism Model Reaches

Event mean concentrations (EMC) for Enterococci were estimated based on fecal coliform EMCs obtained from the Stormwater Management Joint Task Force in 2002. The ENT/FC ratio (0.27) was applied to obtain Enterococci EMCs for different land cover categories. The Enterococci concentrations used for the tidal prism model are included in Table 4-4.

Table 4-4 EMCs for the Armand Bayou Watershed

Land Cover Description	Enterococci EMCs (cfu/dL)
Developed	18,000
Cultivated Land	700
Grassland/Herbaceous	700
Pasture/Hay	700
Woodland	400
Open Water	0
Wetlands	0
Transitional/Bare	12,000

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Average stormwater runoff loads from the contributing subwatershed of each reach are summarized in Table 4-5. Runoff flow and Enterococci load calculations are provided in electronic format in Appendix I.

Table 4-5 Stormwater Runoff Loads to the Tidal Prism Model

Reach	Average Flow (m^3/day)	Average Flow (cfs)	Average Enterococci Load (counts/day)
1113B A	1.64E+03	6.72E+00	7.10E+11
1113B B	3.06E+03	1.25E+00	1.15E+11
1113B C	1.27E+03	5.20E-01	6.27E+10
1113B D	1.10E+03	1.10E+00	8.44E+10
1113B E	2.89E+03	1.18E+00	5.77E+10
1113_02	1.47E+04	6.02E*00	9.59E+10

Note: Variable daily loads were input into the model. The loads presented here are the averages over the simulation period (01/01/2010 to 12/31/2012).

Step 4: Estimate Tidal Flows. Tidal flows for each reach were computed as the tidal exchange over the course of one hour, and were estimated as the difference in volume between two consecutive time steps (Equation 1). To calculate volumes, one hour gage data for the period of 01/01/2010 – 12/31/2012 were downloaded from the Texas Coastal Ocean Observation Network Station 507 at Eagle Point (http://www.cbi.tamucc.edu/obs/507. After adjusting cross-sectional areas to reflect tidal elevation, the hourly volumes for each reach were calculated as the average of the cross-sectional areas at the downstream and upstream reach boundaries times the length of the reach.

Step 5: Verify Flow Balance Using Conductivity. An important step to estimating freshwater loading is to construct a conductivity balance of the system to ensure that the model is correctly estimating freshwater inflows and tidal exchange. Electrical conductivity measures

the salt content (salinity) of water, and the major salts are considered a conservative (non-reactive) tracer. To accomplish this, conductivity data from TCEQ stations and from the NOAA gage were used as a conservative tracer to determine the flow balance of each reach. The conductivity balance calculation for each reach is represented as:

$$C_t V_t = C_{t-1} V_{t-1} + \sum C_{in} V_{in} - \sum C_{out} V_{out} + C_f V_f \quad (6)$$

Where: V_t = volume of reach at time step t [m^3]

V_{t-1} = volume of reach at time step t-1 [m^3]

V_f = freshwater volume [m^3]

V_{in}, V_{out} = tidally influenced volumes for time step t [m^3]

C_t = conductivity in the reach [µS/cm]

C_f = conductivity in the freshwater inputs [µS/cm]

C_{in}, C_{out} = conductivity of the tidally influenced flows [µS/cm]

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The average conductivity values for the existing water quality monitoring stations were used to define the initial conductivity levels in the model reaches. Conductivity data from station 11499 was used to determine downstream boundary conditions. Conductivity in freshwater (runoff, tributaries and effluent) was assumed equal to 500 µS/cm. Tidally influenced volumes were calculated using Equation 1 and freshwater volumes as described earlier. Using the above information Equation 6 was solved for the conductivity in the reach (C_t). The computed conductivity levels were then compared to existing measurements within the impaired waterbody to corroborate that the flows are accurately represented throughout the system. Figure 4-6 presents a comparison of observed and modeled average conductivity concentrations along Tidal Armand and Horsepen Bayous.

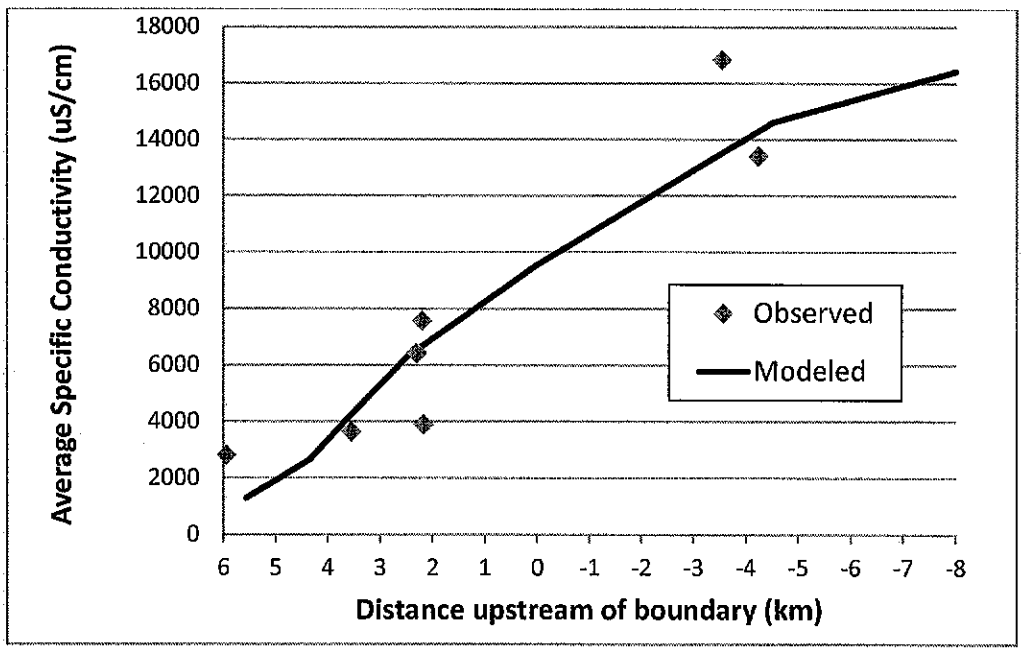

Figure 4-6 Longitudinal Profile of Average Conductivity

Step 6: Perform Mass Balance on Enterococci Levels. Upon validation of the flow balance, a mass-balance on Enterococci for each reach can be computed as follows:

$$N_t V_t = N_{t-1} V_{t-1} + \sum N_{in} V_{in} - \sum N_{out} V_{out} + N_f V_f - k N_{t-1} V_{t-1} \quad (7)$$

Where: N_t = Enterococci level in the reach [counts/dL]

N_f = Enterococci level in the freshwater flow [counts/dL]

N_{in}, N_{out} = Enterococci level in tidally influenced flow [counts/dL]

k = Enterococci first-order decay rate [hr^{-1}]

The average Enterococci concentrations measured at each of the water quality monitoring stations along Armand BayouTidal, Horsepen Bayou and tributaries were used to define the initial conditions in each model reach. The geometric mean of Enterococci concentrations measured in Armand Bayou station 115455 (18 counts/dL) was used to set the downstream boundary concentration of Enterococci. Enterococci levels in runoff, tributaries and WWTFs were estimated as described in Steps 2 and 3.

The model was calibrated by varying the decay rate by reach and adjusting this decay rate within the bounds of reported rates until the model accurately reproduced the temporal and spatial distribution of observed Enterococci within the system. Sinton, *et al.* (1994) and Davies-Colley, *et al.* (1998) reported decay rates between 0.12 and 40 day^{-1}, Anderson, *et al.* (2005) reported rates between 0.73 and 2.1 day^{-1}, and Kay, *et al.* (2005) measured decay rates between 2.2 and 8.5 day^{-1}. Final decay rates applied to the model ranged from 0.5 to 1.2 day^{-1}, which is within the ranges reported in the literature. The decay rates were not varied temporally because insufficient data were available to estimate the seasonal variation in decay rates. The calibrated spreadsheet model is included in Appendix J in electronic format.

Figure 4-7 presents a comparison of measured and modeled Enterococci concentrations along the main stem of Armand and Horsepen Bayou. As can be seen, the model reasonably predicts the spatial distribution of Enterococci along the creek. For the tidal prism model, indicator bacteria data (including fecal coliform and *E. coli*), from 2010 through 2012 for a given station were used to compare to modeled values. Fecal coliform and *E. coli* data were converted to Enterococci concentrations using calculated ENT/FC and ENT/EC ratios (0.27 and 0.34, respectively) as previously described.

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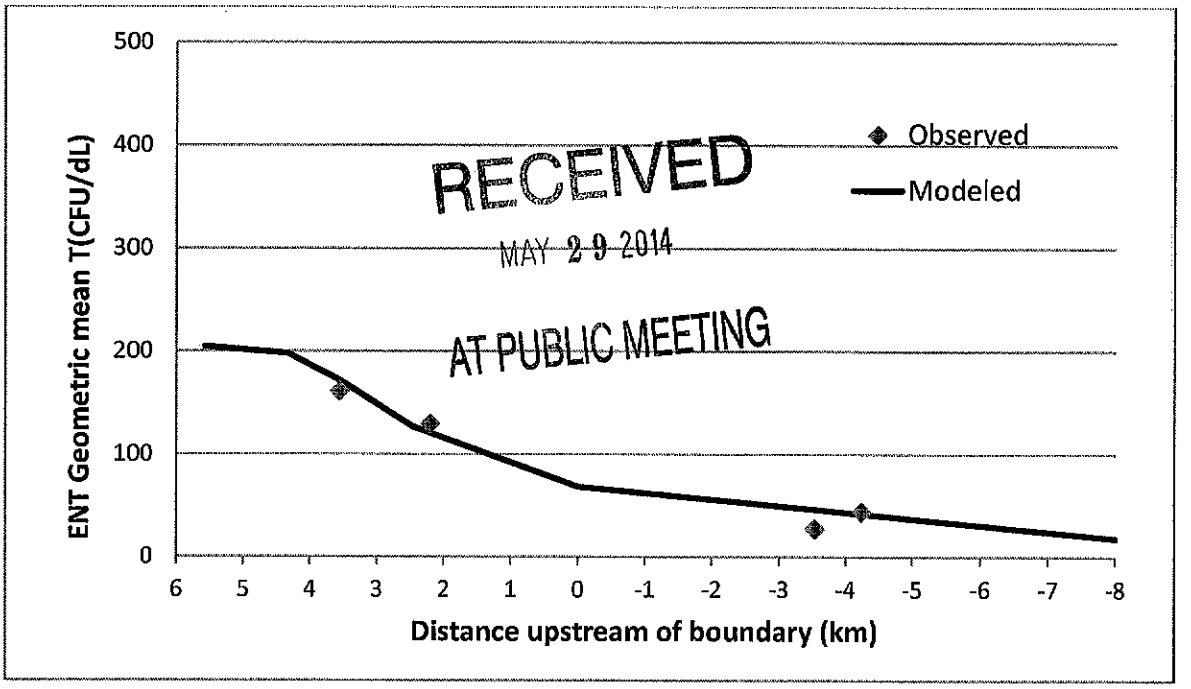

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Figure 4-7 Longitudinal Profile of Enterococci Concentrations

Figures 4-8 through 4-10 show time series of Enterococci concentrations for the water quality monitoring stations in the three streams included in this TMDL report. As indicated by the figures, the model reasonably represents the temporal distribution of Enterococci concentrations for the various WQS.

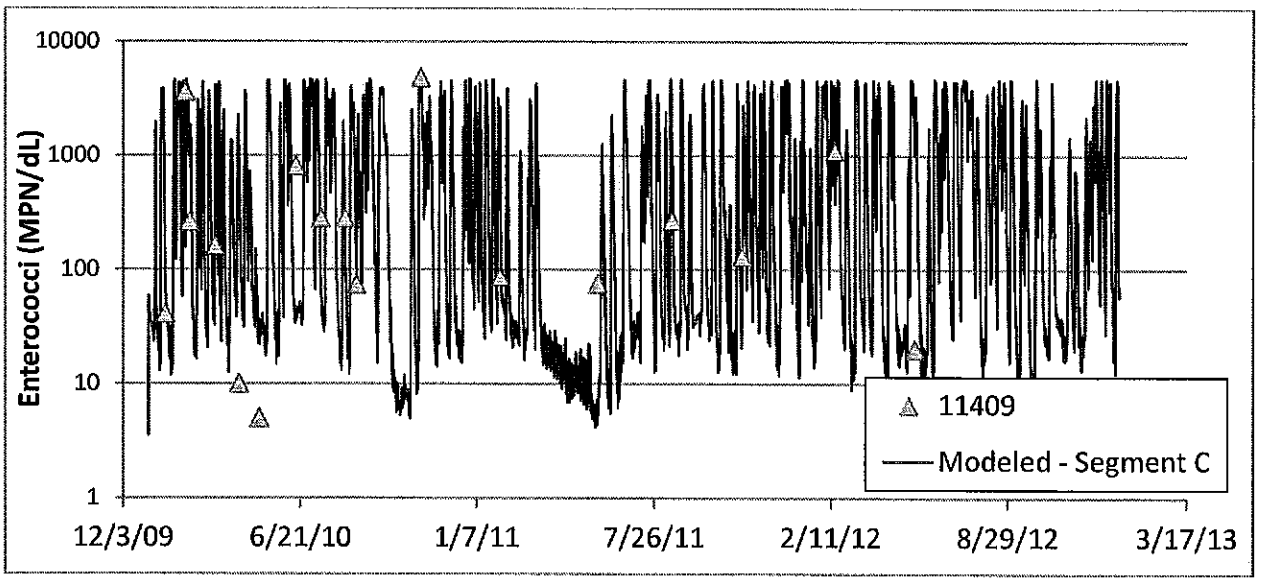

Figure 4-8 Enterococci Levels at Station 11409 (Reach C), Horsepen Bayou (1113B_01)

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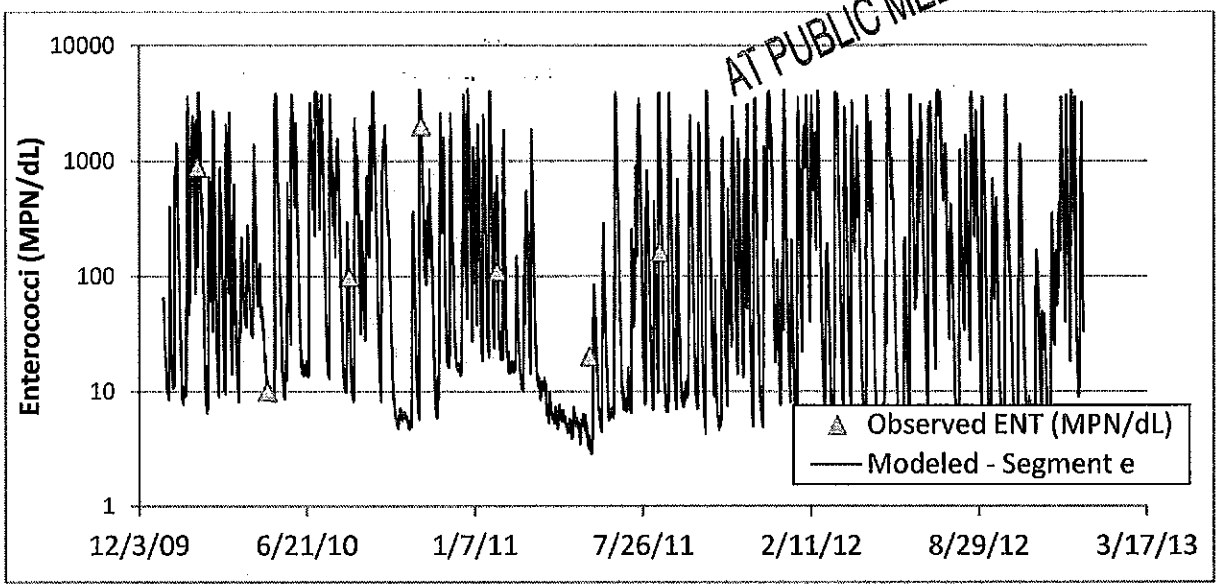

Figure 4-9 Enterococci Levels at Station 17317 (Reach E), Horsepen Bayou (1113B_01)

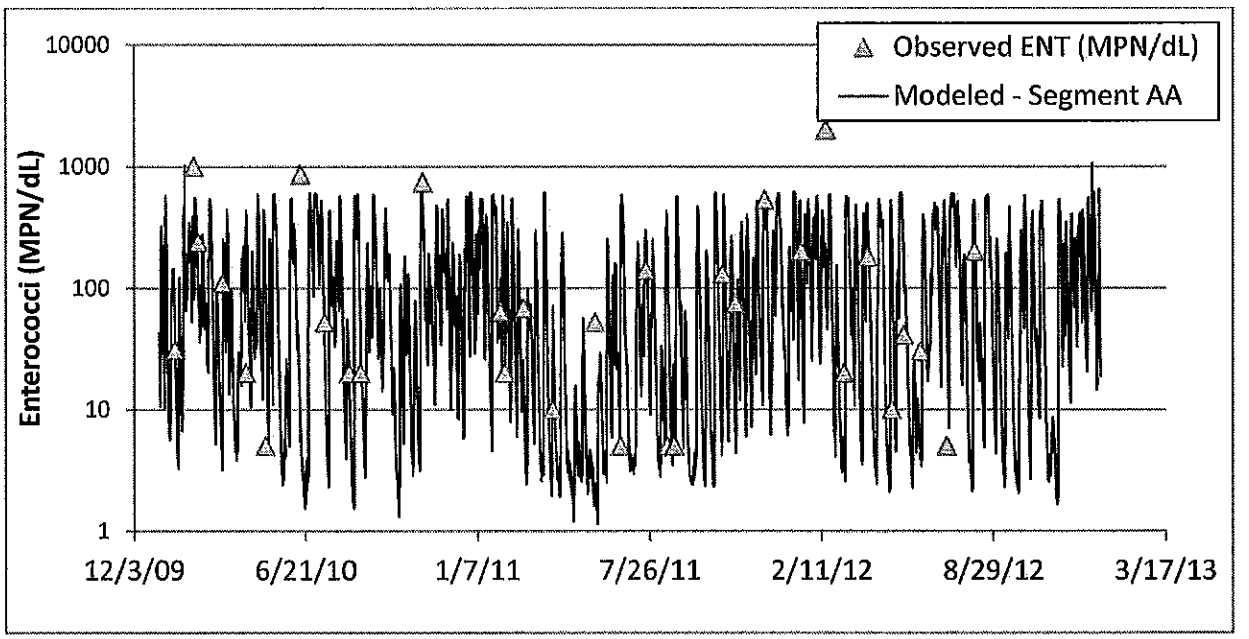

Figure 4-10 Enterococci Levels at Station 11503, Armand Bayou Tidal (1113_02)

4.5.2 Critical Conditions and TMDL Calculation for the Tidal Segments

To calculate the WLA and LA components of the TMDLs for the tidal streams, steps similar to those used for the LDC method are applied. As previously stated, the pollutant load allocation for permitted (point) sources is defined by the WLA. A point source can be either a wastewater (continuous) or stormwater permitted discharge. Stormwater point sources are typically associated with urban and industrialized areas, and recent USEPA guidance includes

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NPDES-permitted stormwater discharges as point source discharges and, therefore, part of the WLA.

WLAs may be set to zero for watersheds with no existing or planned continuous permitted point sources. For watersheds with permitted point sources, WLAs may be derived from TPDES permit limits. A WLA may be calculated for each active TPDES wastewater discharger using a mass balance approach as shown in the equation below. The permitted flow rate used for each point source discharge and the water quality criterion concentration are used to estimate the WLA for each wastewater facility. Through TPDES permits WLAs for WWTPs are constant across all flow conditions and ensure that WQS will be attained (USEPA 2007). All WLA values for each TPDES wastewater discharger are then summed to represent the total WLA for the watershed.

*WLA = criterion * permitted flow * unit conversion factor (#/day)*

Where: criterion = 23 CFU/dL (Enterococci)

flow (mgd) = permitted flow

*unit conversion factor = 37,854,120-dL/day*mgd*

Stormwater runoff can contribute both permitted and unregulated sources of bacteria which must also be accounted for in the TMDL allocations. To be consistent with the LDC method, any stormwater runoff originating from the area of a watershed under the jurisdiction of an MS4 permit is considered a point source contribution and is therefore included as part of the WLA calculation. As such the WLA will be split into WWTP WLA and MS4 WLA. Again to be consistent with the LDC method, the estimated loading from stormwater runoff within each drainage area is separated into stormwater loading from MS4 areas and stormwater loading from unregulated areas. This is done by using the percentage of each drainage area covered by the MS4 permit. An explicit MOS of 5 percent of the criterion is also included in the TMDL calculation. The stormwater loading from unregulated areas is considered the LA. Therefore, another way of expressing the LA from unregulated stormwater runoff is calculated as the TMDL minus the margin of safety minus the WLA (sum of WWTP and MS4).

Percent reduction goals were calculated by changing the loads in the tidal prism model until all the reaches have concentrations lower than or equal to the 35 counts/dL criterion for Enterococci. It is noted that the loads coming from upstream freshwater segments, addressed with LDCs, were assumed to be in compliance with the 126 counts/dL criterion for *E. coli* or 42 counts/dL for Enterococci if the 0.34 ratio is used.

The fact that most the WQM stations on the Study Area exceed the geometric mean standard for Enterococci indicates that evaluating mean source inputs (*i.e.*, under mean conditions) via a mass balance approach will be sufficient to ascribe load allocations. The daily load estimates for the simulation period were reduced by a constant such that the geometric mean standard was met (*i.e.*, 33/dL). The percent reduction was computed as follows:

$$\%R = \left(1 - \frac{1}{C_R}\right) \cdot 100 \qquad (8)$$

where C_R is the constant by which the daily Enterococci loadings are reduced and %R is the associated percent reduction in the Enterococci levels.

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CHAPTER 5
TMDL CALCULATIONS

5.1 Results of TMDL Calculations

The calculations and results of the TMDLs for the 303(d) listed water bodies in the Study Area are provided in Section 5. The bacteria load allocations derived from the two different technical approaches used for freshwater and tidal water bodies are discussed together in each subsection of Section 5 below.

5.2 Estimated Loading and Critical Conditions

USEPA regulations at 40 CFR 130.7(c) (1) require TMDLs to take into account critical conditions for stream flow, loading, and all applicable water quality standards. To accomplish this, available instream WQM data were evaluated with respect to stream flows, tidal flux, and the magnitude of water quality criteria exceedance. TMDLs are derived for specific indicator bacteria in 303(d) listed water bodies at specific WQM stations based on LDCs for Unnamed Tributary of Mary's Creek (1102G_01) and a mass balance calculation using a tidal prism for tidal streams.

As previously described in Chapter 4, a LDC was used to calculate the bacteria load at the criterion for the freshwater segment over a range of flow conditions. This calculation produces the maximum bacteria load in the stream without exceeding the instantaneous standard over the range of flow conditions.

The pollutant load allocations and percent reduction goals for each flow regime are summarized in Section 5.8. The highest percent reduction goals for the segment was found to occur in the flow regime with the highest flows (0–20th percentile) and consequently, this was the flow regime used to estimate the TMDL.

Figure 5-1 represents the LDC for Armand Bayou Above Tidal (1113A_01) is based on *E coli* bacteria measurements at sampling location 11404 (Armand Bayou at Genoa-Red Bluff Rd). The LDC indicates that geometric mean observed *E coli* loading exceeds the TMDL, established using the geometric mean water quality target, under the highest flow regime. A 70% reduction of the observed loads is required in order to meet the TMDL under the high flow condition.

Figure 5-2 represents the LDC for Unnamed Tributary to Horsepen Bayou (1113C_01) is based on *E coli* bacteria measurements at sampling location 17485 (Unnamed Tributary of Horsepen Bayou Tidal at Penn Hills). The LDC indicates that *E coli* levels exceed the geometric mean water quality target under highest and mid-range flow conditions. A 77% reduction of the observed loads is required at the high flow condition and a 36% reduce mid-range flow condition in order to meet the TMDL for both flow conditions.

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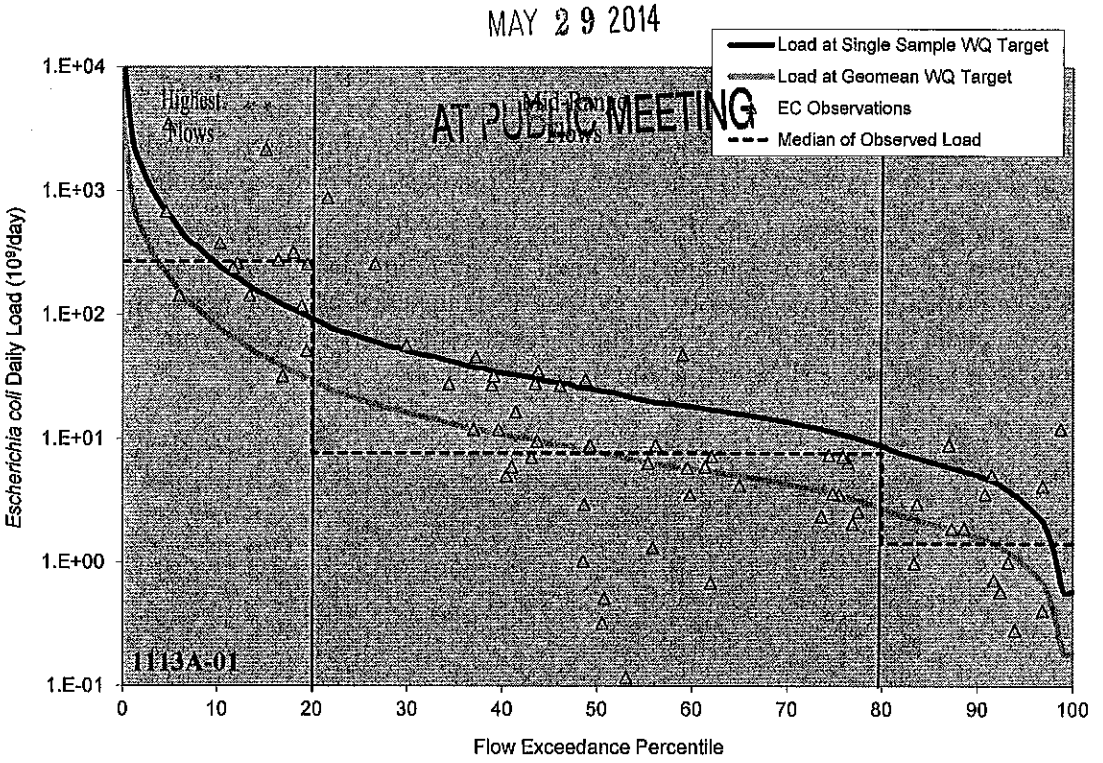

Figure 5-1: Load Duration Curve for Armand Bayou Above Tidal (1113A_01)

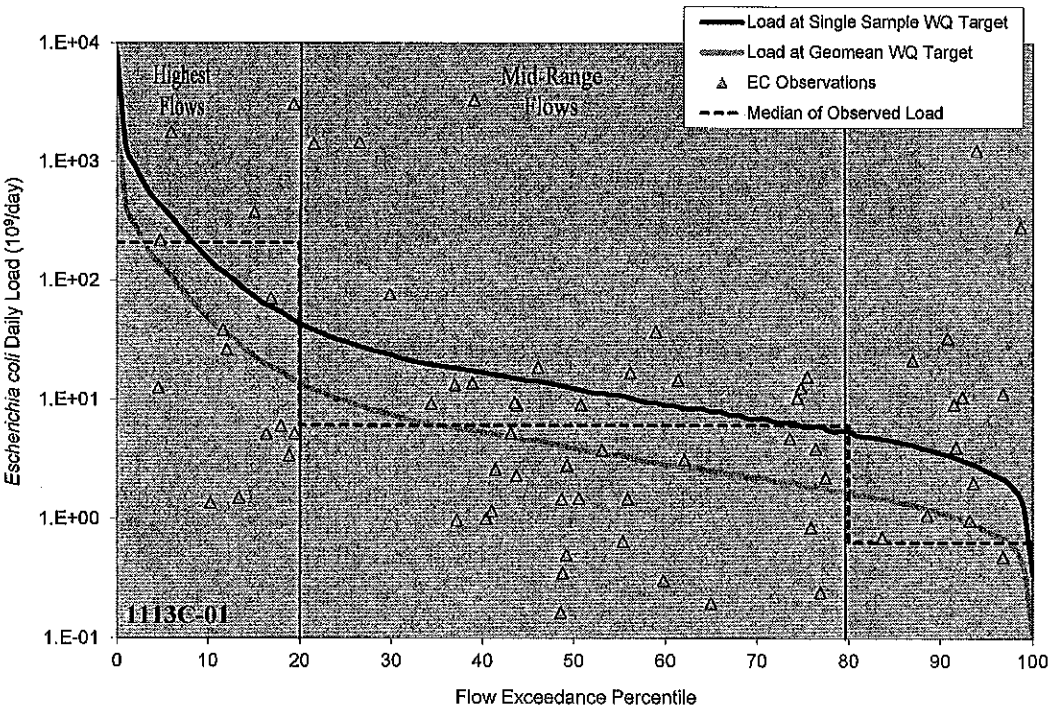

Figure 5-2: Load Duration Curve for Unnamed Tributary to Horsepen Bayou (1113C_01)

Figure 5-3 represents the LDC for Willow Springs Bayou (1113D_01) is based on *E coli* bacteria measurements at sampling location 17487 (Willow Spring at Bandridge Rd in southeast Houston). The LDC indicates that *E coli* levels exceed the instantaneous and geometric mean water quality criteria under all three flow conditions. Load reductions ranging from 70 to 87.5% are required to meet the TMDL across the flow conditions.

Figure 5-4 represents the LDC for Big Island Slough (1113E_01) is based on *E coli* bacteria measurements at sampling location 17486 (Big Island Slough at Hillridge Rd). The LDC indicates that *E coli* levels exceed the instantaneous and geometric mean water quality criteria under all three flow conditions. Load reductions ranging from 72.5 to 89.6% are required to meet the TMDL across the flow conditions.

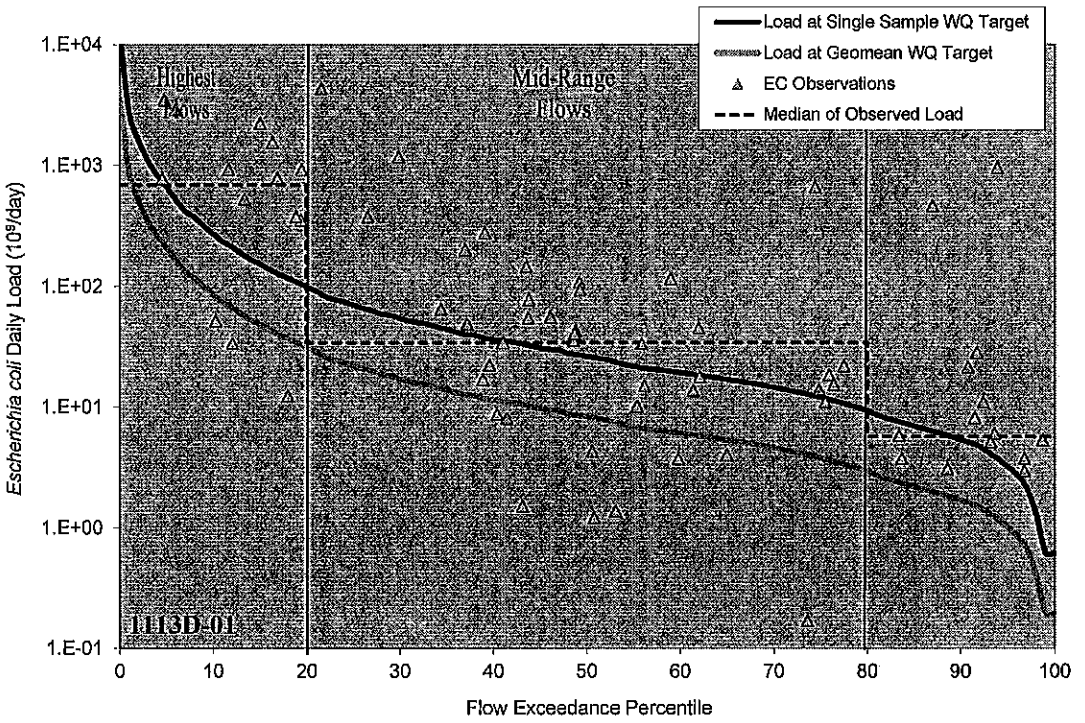

Figure 5-3: Load Duration Curve for Willow Springs Bayou (1113D_01)

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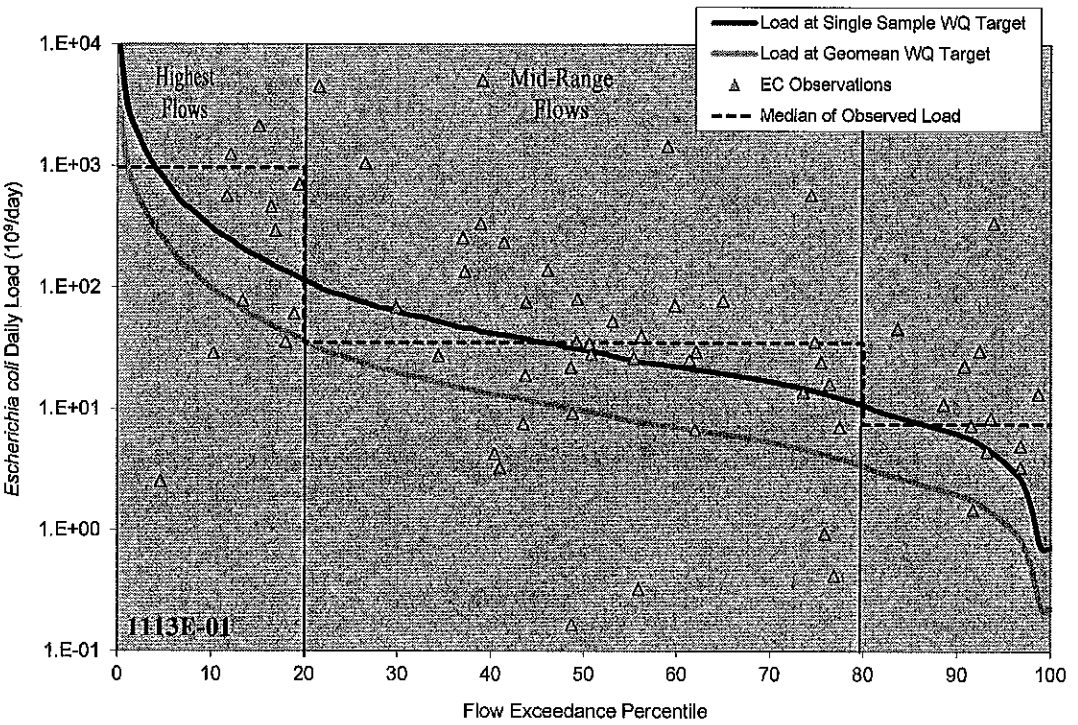

Figure 5-4: Load Duration Curve for Big Island Slough (1113E_01)

Existing Enterococci loads to the TMDL tidal segments are summarized in Table 5-1. The estimated existing loads are calculated as the sum of runoff, tributary, and WWTF loads to model reaches C (Horsepen Bayou), E (Horsepen Bayou), and Armand Bayou Tidal (1113_02).

Table 5-1 Estimated Existing Enterococci Loads to TMDL Tidal Segments

Segment	Receiving Stream	Enterococci Load (counts/day)
1113B_01	Horsepen Bayou (Reach C)	2.39E+07
1113B_01	Horsepen Bayou (Reach E)	2.45E+08
1113_02	Armand Bayou Tidal	2.32E+08

The percent reduction goals that are required to meet the geometric mean standard for contact recreation in the TMDL tidal segments are illustrated in Figure 5-2. The required load reductions were calculated at the end of the reach containing the sampling location. Required load reductions are summarized in Table 5-2.

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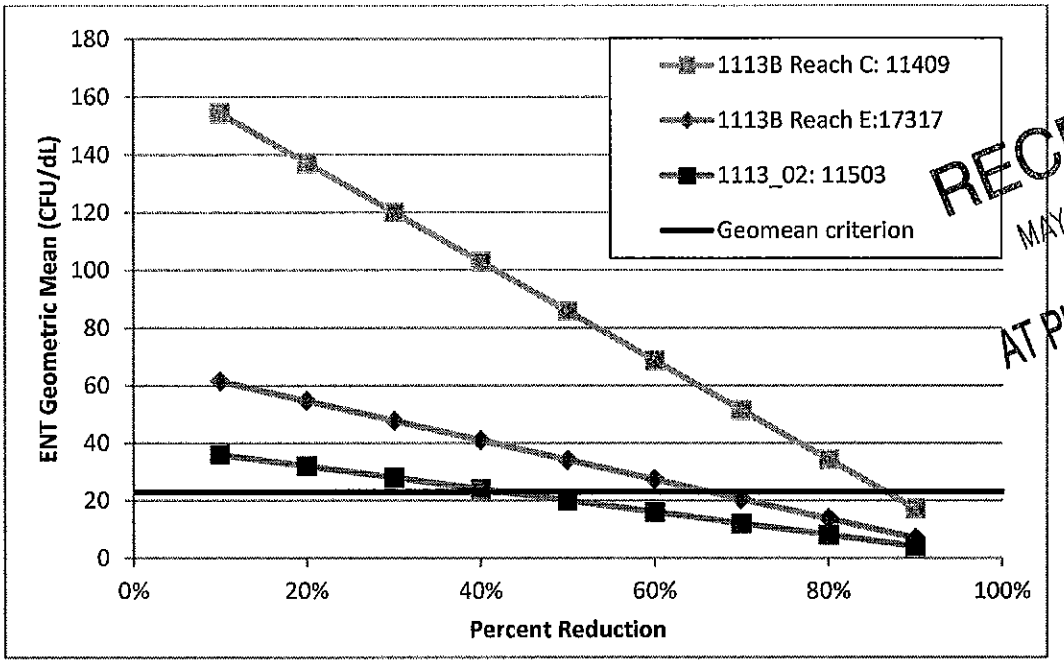

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Figure 5-2 Contact Recreation Standards Attainment for Tidal Segments

Table 5-2 TMDL Percent Reductions Required to Meet Contact Recreation Standard for Tidal Segments

Segment	Sampling Location	Stream Name	Percent Reduction Required
1113B_01	11409	Horsepen Bayou (Reach C)	86.59%
1113B_01	17317	Horsepen Bayou (Reach E)	66.31%
1113_02	11503	Armand Bayou Tidal	42.48%

5.3 Wasteload Allocation

TPDES-permitted facilities are allocated a daily wasteload calculated as their permitted discharge flow rate multiplied by one half of the instream geometric mean water quality criterion. Table 5-1 summarizes the WLA for the TPDES-permitted facilities within the Study Area. The WWTFs will not be subject to all listed indicator bacteria. The WLA for each facility (WLA_{WWTF}) is derived from the following equation:

$$WLA_{WWTF} = criterion * flow * unit\ conversion\ factor\ (\#/day)$$

Where:

criterion = 23 and 126/2 counts/dL for enterococci and E coli, respectively

flow (10^6 gal/day) = permitted flow

unit conversion factor = 37,854,120-10^6gal/day

When multiple TPDES facilities occur within a watershed, loads from individual WWTFs are summed and the total load for continuous point sources is included as part of the WLA_{WWTF} component of the TMDL calculation for the corresponding segment. When there are no TPDES WWTFs discharging into the contributing watershed of a WQM station, then WWTF WLA is zero. Compliance with the WLA_{WWTF} will be achieved by adhering to the fecal coliform discharge limits and disinfection requirements of TPDES permits.

Stormwater discharges from MS4 areas are considered permitted point sources. Therefore, the WLA calculations must also include an allocation for permitted stormwater discharges. Given the limited amount of data available and the complexities associated with simulating rainfall runoff and the variability of stormwater loading a simplified approach for estimating the WLA_{MS4} areas was used in the development of these TMDLs. For both the LDC and tidal prism method the percentage of each watershed that is under a TPDES MS4 permit is used to estimate the amount of the overall runoff load that should be dedicated as the permitted stormwater contribution in the $WLA_{STORMWATER}$ component of the TMDL. The difference between the total stormwater runoff load and the portion allocated to $WLA_{STORMWATER}$ constitutes the LA component of the TMDL (direct nonpoint runoff).

Table 5-3: Wasteload Allocations for TPDES-Permitted Facilities

TPDES Number	NPDES NUMBER	Facility Name	Final Permitted Flow (MGD)	Enterococci (counts/day)
10495-152	TX0069736	Metro Central WWTP	5	4.35E+09
10539-001	TX0022543	Robert Savely Water Reclamation Facility	10	8.71E+09
03523-000	TXL005000	City of Houston Sludge Plant	n/a	n/a
03029-000	TX0103900	Equistar Chemicals Bayport Complex	n/a	n/a

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For the freshwater stream, the flow dependent calculations for the MS4 portion of the WLA are derived using LDC and the MS4 percentages provided in Table 5-5.

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5.4 Load Allocation

As discussed in Section 3, unregulated sources of bacteria loading to the receiving streams of each waterbody emanate from a number of different sources. The data analyses demonstrate that exceedances at the WQM stations are the result of a variety of nonpoint source loading. The LAs for each stream segment are calculated as the difference between the TMDL, MOS, WLA, and WLA for MS4 as follows:

$$LA = TMDL - \sum WLA_{WWTF} - \sum WLA_{STORMWATER} - MOS$$

Where:

LA = allowable load from unregulated sources
TMDL= total allowable load
$\sum WLA_{WWTF}$ = sum of all WWTF loads
$\sum WLA_{STORMWATER}$ = sum of all Stormwater loads
MOS = margin of safety

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5.5 Seasonal Variability

Federal regulations (40 CFR §130.7(c)(1)) require that TMDLs account for seasonal variation in watershed conditions and pollutant loading. Seasonal variation was accounted for in these TMDLs by using more than 5 years of water quality data and by using the longest period of USGS flow records when estimating flows to develop flow exceedance percentiles.

Analysis of the available data for *E coli* and enterococci in Table 1-13 showed no consistent trend among all evaluated stations for water and/or cooler months.

5.6 Allowance for Future Growth

Compliance with these TMDLs is based on keeping the indicator bacteria concentrations in the selected waters below the limits that were set as criteria for the individual sites. Future growth of existing or new point sources is not limited by these TMDLs as long as the sources do not cause indicator bacteria to exceed the limits. The assimilative capacity of streams increases as the amount of flow increases. Increases in flow allow for additional indicator bacteria loads if the concentrations are at or below the contact recreation criterion. The addition of any future wastewater discharge facilities will be evaluated on a case-by-case basis.

To account for the high probability that new additional flows from WWTF may occur in any of the segments, a provision for future growth was included in the TMDL calculations by estimating permitted flows to year 2050 using population projections completed by the Texas Water Development Board. A summary of the methodology used to predict waste water flow capacity based on population growth is included in Appendix K. For the freshwater segments, only Big Island Slough (1113E_01) does not already have area completely serviced by WWTF(s) outside of the AU watershed. An estimated future flow increase of 0.5 MGD was applied to determine the future growth load in Big Island Slough (1113E_01). For the tidally influenced segments, only Horsepen Bayou (1113B_01) contains WWTFs, while the area in Armand Bayou Tidal (1113_02) is completely serviced by a WWTF outside the AU watershed boundary. Loads were calculated using the projected flows and a 23 counts/dL concentration were input in the tidal prism model along with all the other existing loads. The loads were then reduced by different percentages until the contact recreation criterion was met in all the reaches. The reduced loads were then added to calculate the assimilative capacity or $TMDL_{future}$. In both cases, the WLA_{WWTF} for future population growth is the difference between the $TMDL_{future}$ and the TMDL calculated using current conditions.

5.7 Margin of Safety

Federal regulations (40 CFR §130.7(c)(1)) require that TMDLs include an MOS. The MOS is a conservative measure incorporated into the TMDL equation that accounts for the uncertainty associated with calculating the allowable pollutant loading to ensure geometric mean criterion are attained. USEPA guidance allows for use of implicit or explicit expressions of the MOS, or both. When conservative assumptions are used in development of the TMDL, or conservative factors are used in the calculations, the MOS is implicit. When a specific percentage of the TMDL is set aside to account for uncertainty, then the MOS is considered explicit.

The TMDL for the freshwater segment incorporates an explicit MOS by setting a more stringent target for indicator bacteria loads that is 5 percent lower than the single sample criterion. The explicit margin of safety was used because of the limited amount of data. For contact recreation, this equates to a single sample target of 379 MPN/100mL for *E coli* and a geometric mean target of 120 MPN/100mL. The net effect of the TMDL with MOS is that the assimilative capacity or allowable pollutant loading of each waterbody is slightly reduced. The TMDL for the freshwater stream in this report incorporate an explicit MOS in the LDC by using 95 percent of the single sample criterion. For the tidal segments, the MOS was also explicit. But in this case, the MOS was based on allowable loading, not concentration. After the tidal prism model calculated the total assimilative capacity for enterococci (the TMDL), 5 percent of the allowable load was computed as the MOS.

5.8 TMDL Calculations

The bacteria TMDLs for the 303(d)-listed WQM stations covered in this report were derived using LDCs and the tidal prism model. A TMDL is expressed as the sum of all WLAs (point source loads), LAs (nonpoint source loads), and an appropriate MOS, which attempts to account for uncertainty concerning the relationship between effluent limitations and water quality.

This definition can be expressed by the following equation:

$$TMDL = \Sigma WLA + \Sigma LA + MOS + Future\ Growth$$

Tables 5-2 through 5-5 summarize the pollutant load allocations and percent reduction goals at current flows, for each flow regime, for the freshwater segments. Tables 5-4 through 5-8 summarize the estimated maximum allowable load of *E coli* for the freshwater assessment units included in this project while tidal stream segments are summarized in Table 5-9. These are calculated from the tidal prism model based on average percent reductions from total existing loading (WWTFs, runoff and tributaries) to the water body (Table 5-2).

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Table 5-4: E coli TMDL Calculations for Armand Bayou Above Tidal (1113A_01)

Station 11404			
Flow Regime %	**0%-20%**	**20%-80%**	**80%-100%**
Median Flow, Q (cfs)	27.7	2.7	0.6
Observed Geomean Load (10^9 org/day)	2.70E+02	7.70E+00	1.43E+00
TMDL (Q*C) (10^9 org/day)	8.53E+01	8.25E+00	1.70E+00
MOS (Q*C*0.05) (10^9 org/day)	4.26E+00	4.12E-01	8.49E-02
Allowable Load at Water Quality Target,	8.10E+01	7.83E+00	1.61E+00
Load Reduction (10^9 org/day)	1.89E+02	0.00E+00	0.00E+00
Load Reduction (%)	70.0%	0.0%	0.0%
TMDL (Qfuture*WQS) (10^9 org/day)	0.00E+00		

Table 5-5: E coli TMDL Calculations for Unnamed Tributary to Horsepen Bayou (1113C_01)

Station 17485			
Flow Regime %	**0%-20%**	**20%-80%**	**80%-100%**
Median Flow, Q (cfs)	16.6	1.3	0.4
Observed Geomean Load (10^9 org/day)	2.09E+02	6.10E+00	6.38E-01
TMDL (Q*C) (10^9 org/day)	5.11E+01	4.12E+00	1.19E+00
MOS (Q*C*0.05) (10^9 org/day)	2.56E+00	2.06E-01	5.94E-02
Allowable Load at Water Quality Target,	4.86E+01	3.92E+00	1.13E+00
Load Reduction (10^9 org/day)	1.60E+02	2.18E+00	0.00E+00
Load Reduction (%)	76.7%	35.8%	0.0%
TMDL (Qfuture*WQS) (10^9 org/day)	0.00E+00		

Table 5-6: E coli TMDL Calculations for Willow Springs Bayou (1113D_01)

Station 17487			
Flow Regime %	**0%-20%**	**20%-80%**	**80%-100%**
Median Flow, Q (cfs)	29.2	2.8	0.6
Observed Geomean Load (10^9 org/day)	6.87E+02	3.41E+01	5.70E+00
TMDL (Q*C) (10^9 org/day)	9.01E+01	8.71E+00	1.79E+00
MOS (Q*C*0.05) (10^9 org/day)	4.50E+00	4.35E-01	8.96E-02
Allowable Load at Water Quality Target,	8.56E+01	8.27E+00	1.70E+00
Load Reduction (10^9 org/day)	6.01E+02	2.58E+01	4.00E+00
Load Reduction (%)	87.5%	75.7%	70.1%
TMDL (Qfuture*WQS) (10^9 org/day)	0.00E+00		

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Table 5-7: E coli TMDL Calculations for Big Island Slough (1113E_01)

Station 17486			
Flow Regime %	**0%-20%**	**20%-80%**	**80%-100%**
Median Flow, Q (cfs)	34.1	3.3	0.7
Observed Geomean Load (10^9 org/day)	9.63E+02	3.51E+01	7.53E+00
TMDL (Q*C) (10^9 org/day)	1.05E+02	1.02E+01	2.09E+00
MOS (Q*C*0.05) (10^9 org/day)	5.25E+00	5.08E-01	1.05E-01
Allowable Load at Water Quality Target,	9.98E+01	9.65E+00	1.99E+00
Load Reduction (10^9 org/day)	8.63E+02	2.55E+01	5.55E+00
Load Reduction (%)	89.6%	72.5%	73.6%
TMDL (Qfuture*WQS) (10^9 org/day)	4.35E+-01		

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Table 5-8: E coli TMDL Summary Calculations for Non-tidal Segments

Assess-ment Unit	Stream Name	Indicator Bacteria	TMDL[a] (MPN/day)	WLA_{WWTF}[b] (MPN/day)	$WLA_{STORMWATER}$[c] (MPN/day)	LA[d] (MPN/day)	MOS[e] (MPN/day)	Future Growth[f] (MPN/day)
1113A_01	Armand Bayou Above Tidal	*E coli*	8.53E+10	0.00E+00	8.10E+10	0.00E+00	4.26E+09	0.00E+00
1113C_01	Unnamed Tributary to Horsepen Bayou	*E coli*	5.11E+10	0.00E+00	4.86E+10	0.00E+00	2.56E+09	0.00E+00
1113D_01	Willow Springs Bayou	*E coli*	9.01E+10	0.00E+00	8.56E+10	0.00E+00	4.50E+09	0.00E+00
1113E_01	Big Island Slough	*E coli*	1.05E+11	0.00E+00	9.32E+10	6.57E+09	5.25E+09	1.19E+09

[a] *Maximum allowable load for the flow range requiring the highest percent reduction (Table 5-4)*
[b] *Sum of loads from the WWTF discharging upstream of the TMDL station. Individual loads are calculated as permitted flow * 126/2 (E coli) MPN/100mL*conversion factor (Table 5-3)*
[c] $WLA_{STORMWATER} = (TMDL - MOS - WLA_{WWTF})$*(percent of drainage area covered by stormwater permits)*
[d] $LA = TMDL - MOS - WLA_{WWTF} - WLA_{STORMWATER}$-*Future growth*
[e] *MOS = TMDL x 0.05*
[f] *Projected increase in WWTF permitted flows*126/2*conversion factor*

Table 5-9: TMDL Calculations for Tidal Segments

Assess-ment Unit	Stream Name	Indicator Bacteria	TMDL[a] (MPN/day)	WLA_{WWTF}[b] (MPN/day)	$WLA_{STORMWATER}$[c] (MPN/day)	LA[d] (MPN/day)	MOS[e] (MPN/day)	Future Growth[f] (MPN/day)
1113_02	Armand Bayou Tidal	Enterococci	1.26E+12	0.00E+00	1.19E+12	0.00E+00	6.28E+10	0.00E+00
1113B_01	Horsepen Bayou	Enterococci	7.79E+11	1.31E+10	7.27E+11	0.00E+00	3.89E+10	4.23E+09

[a] *Maximum allowable load for the flow range requiring the highest percent reduction (Table 5-4)*
[b] *Sum of loads from the WWTF discharging upstream of the TMDL station. Individual loads are calculated as permitted flow * 126/2 (E coli) MPN/100mL*conversion factor (Table 5-3)*
[c] $WLA_{STORMWATER} = (TMDL - MOS - WLA_{WWTF})$*(percent of drainage area covered by stormwater permits)*
[d] $LA = TMDL - MOS - WLA_{WWTF} - WLA_{STORMWATER}$-*Future growth*
[e] *MOS = TMDL x 0.05*
[f] *Projected increase in WWTF permitted flows*23*conversion factor*

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CHAPTER 6
PUBLIC PARTICIPATION

To provide focused stakeholder involvement in the Armand Bayou Bacteria TMDL and the implementation phase, a 24 member steering committee was formed. In accordance with House Bill 2912, the group has balanced representation within the watershed and commitment was formalized. TCEQ approved the formation of a Armand Bayou stakeholder group and approved the membership. The group has ground rules and H-GAC maintains a membership roster and has a web page dedicated to the Armand Bayou Bacteria TMDL project: (http://www.h-gac.com/community/water/tmdl/armand-bayou/default.aspx)

The responsibility of each stakeholder on the committee is to communicate project information to others being represented and provide personal/organization perspective on all issues; knowledge of the watershed; comments and suggestions during the project; and solicit input from others. Regular meetings have been held and TCEQ solicits stakeholder comment at each project milestone; and assist stakeholders with communications. H-GAC has assisted TCEQ with the public participation and with a facilitator (M.J. Naquin). As contractors to TCEQ, the University of Houston and Parsons provide technical support and presentations at stakeholder meetings.

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CHAPTER 7
REFERENCES

American Veterinary Medical Association. 2002. U.S. Pet Ownership and Demographics Sourcebook (2002 Edition). Schaumberg, IL.

ASAE. 1998. American Society of Agricultural Engineers Standards, 45th edition: Standards, Engineering Practices Data. St. Joseph, MI.

Burian, S. J., Shepherd, J.M. 2005. "Effect of Urbanization on the Diurnal Rainfall Pattern in Houston" Hydrological Processes. 19.5:1089-1103. March 2005.

Canter, L.W. and R.C. Knox. 1985. Septic tank system effects on ground water quality. Lewis Publishers, Boca Raton, FL.

Close. 2013. Jason Close, HCFCD, personal communication on August 2013.

Coastal Coordination Council. 2006. Watershed Protection Plan for Armand Bayou. http://www.h-gac.com/community/water/watershed_protection/armand/default.aspx

Cogger, C.G. and B.L. Carlile. 1984. Field performance of conventional and alternative septic systems in wet soils. *J. Environ. Qual.* 13 (1).

Drapcho, C.M. and A.K.B. Hubbs . 2002. Fecal Coliform Concentration in Runoff from Fields with Applied Dairy Manure. http://www.lwrri.lsu.edu/downloads/drapcho Annual%20report01.02.pdf

Dunbar, Larry. 1998. "A Critical Analysis of Flood Control Proposals for Clear Creek." Galveston Bay Conservation and Preservation Association.

Griffith, Glenn; Sandy Bryce, James Omernik, Anne Rogers. 2007. Ecoregions of Texas. ftp://ftp.epa.gov/wed/ecoregions/tx/TXeco_Jan08_v8_Cmprsd.pdf

Hall, S. 2002. Washington State Department of Health, Wastewater Management Program Rule Development Committee, Issue Research Report - Failing Systems, June 2002.

HCOEM. 2007. Harris County Office of Emergency Management. http://www.hcoem.org/default2.php

H-GAC. 2005. "Gulf Coast Regional Water Quality Management Plan Update: 2005; Appendix III: On-site sewer facilities - Considerations, Solutions, and Resources." H-GAC, Houston, TX.

Laird. 2013. Kim Laird, TCEQ, Region 12, personal communication on August 2013.

Metcalf and Eddy. 1991. Wastewater Engineering: Treatment, Disposal, Reuse: 2nd Edition.

Montgomery Watson America, Inc. 2000. Regional Surface Water Plant Feasibility Study for Brazoria, Fort Bend, and West Harris Counties. Prepared for the Gulf Coast Water Authority and the Texas Water Development Board, Dickinson and Austin, Texas.

NOAA. 2011. National Oceanic and Atmospheric Administration, Coastal Services Center. National Land Cover Database 2011. Accessed June 2013 http://www.h-gac.com/rds/gis_data/clearinghouse/

PRISM Group 2006. Oregon State University, http://www.prismclimate.org, created 12 June 2006.

Reed, Stowe &Yanke, LLC. 2001. Study to Determine the Magnitude of, and Reasons for, Chronically Malfunctioning On-Site Sewage Facility Systems in Texas. September 2001.

Schueler, T.R. 2000. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. In *The Practice of Watershed Protection,* T.R. Schueler and H.K. Holland, eds. Center for Watershed Protection, Ellicott City, MD.

TCEQ. 2010. Texas Surface Water Quality Standards. §307.1-307.10. Adopted by the Commission: June 30, 2010; Effective July 22, 2010 as the state rule. Austin, Texas.

TCEQ. 2012. Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) & 303(d) www.tceq.texas.gov/waterquality/assessment/waterquality/assessment/12twqi/twqi12

TCEQ. 2010. Draft 2010 Guidance for Assessing and Reporting Surface Water Quality in Texas.

University of Florida. 1987. Institute of Food and Agricultural Sciences, University Of Florida, Florida Cooperative Extension Service, No. 31, December, 1987.

U.S. Census Bureau. 1995. http://www.census.gov/.

U.S. Census Bureau. 2000. http://www.census.gov (April 21, 2005).

U.S. Census Bureau. 2010. http://wwww.census.gov

USDA. 2007. Census of Agriculture, National Agricultural Statistics Service, United States Department of Agriculture. http://www.agcensus.usda.gov/Publications/2007/index.php

USEPA. 1983. Final Report of the Nationwide Urban Runoff Program. U.S. Environmental Protection Agency, Water Planning Division.

USEPA. 1986. Ambient Water Quality Criteria for Bacteria – January 1986. Office of Water Regulation and Standards. USEPA 44015-84-002.

USEPA. 2000. Bacterial Indicator Tool User's Guide. Washington, D.C., US EPA: EPA-823-B-01-003.

USEPA. 2001. Protocol for Developing Pathogen TMDLs. First Edition. Office of Water, USEPA 841-R-00-002.

USEPA. 2002. Implementation Guidance for Ambient Water Quality Criteria for Bacteria. May 2002 Draft. EPA-823-B-02-003.

USEPA. 2005. U.S. Environmental Protection Agency, Office of Water. Stormwater Phase II Final Rule. EPA833-F-00-002 Fact Sheet 2.0. December 2005.

USEPA. 2007. U.S. Environmental Protection Agency, Office of Water. An approach for using Load Duration Curves in the Development of TMDLs. EPA841-B-07-006. August 2007.

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APPENDIX A
AMBIENT WATER QUALITY BACTERIA DATA – 2003 TO 2010

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APPENDIX B
USGS FLOW DATA AND ARMAND BAYOU INSTANTANEOUS FLOW DATA*

**** See attached CD***

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APPENDIX C
TIDE DATA*

**** See attached CD***

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APPENDIX D
DISCHARGE MONITORING REPORTS – 2003 - 2013

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APPENDIX E
WILDLIFESPECIES LIST

Armand Bayou Nature Center. March 2002. Natural Resource Management Plan (2002 - 2007). Pasadena, TX.

http://www.abnc.org/uploads/pdf/NATURAL_RESOURC_%20MANAGEMENT_PLAN.pdf

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APPENDIX F
GENERAL METHODS FOR ESTIMATING FLOW AT TMDL WQM STATIONS

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APPENDIX F
GENERAL METHODS FOR ESTIMATING FLOW AT WQM STATIONS

Because there are no USGS or HCFCD flow gages located in the Armand Bayou Watershed, a procedure was developed for estimating historical flows at multiple locations in Armand Bayou. There are no gage records available for the Bayou other than a handful of individual flow measurement. To support LDC development, ten years of daily flow estimates are needed at the four impaired locations in the Bayou.

7.1 Approach

A statistical model based on historical flows from adjacent Bayous will be used to estimate flows. The flow records for several adjacent Bayous appear to be reliable, complete and are highly correlated among one another. These flow time series will be used to derive candidate flow prediction models. Both linear and nonlinear models were tested but ultimately the nonlinear model was selected as the preferred option for developing flow estimates for the Bayou.

7.2 Data

Extended periods of daily flow records are available on Sims Bayou and Vince Bayou. Sims and Vince are adjacent to Armand Bayou and similar in size and land use. A comparison of the two gages is provided in Table 1. In addition, a summary of land cover for each of the gage drainage areas is presented in Table 2 and compared with the land cover for Armand Bayou. In addition, a graphical comparison of land cover and gage locations is shown in Figure 1.

Table F-7: USGS Gages in the area with a Continuous Period of Record from 2002-2012

Gage Number	Name	Percent		Drainage Area (acres)	Mean Flow (cfs)	Number of Continuous Data Points
		Developed Land	Forest/Wetland			
08075730	Vince Bayou at Pasadena, TX	98%	1%	4,863	17.3	4018
08075400	Sims Bayou at Hiram Clarke St, Houston, TX	78%	7%	13,279	38.8	4018

Table F-2: Land Cover Summary

	1113A_01		1113C_01		1113D_01		1113E_01		Sims		Vince	
Land cover class	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Open Water	41	1%	0	0%	38	1%	61	1%	116	1%	12	0%
Developed, Open Space	631	17%	215	12%	1089	22%	869	17%	2424	18%	679	14%

	1113A_01		1113C_01		1113D_01		1113E_01		Sims		Vince	
Land cover class	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Developed, Low Intensity	809	22%	327	18%	783	16%	745	15%	2791	21%	1125	23%
Developed, Medium Intensity	1178	32%	1032	58%	1607	33%	1293	25%	4403	33%	2043	42%
Developed, High Intensity	511	14%	190	11%	392	8%	483	9%	698	5%	927	19%
Barren Land	10	0%	0	0%	25	1%	32	1%	40	0%	2	0%
Deciduous Forest	50	1%	7	0%	32	1%	81	2%	639	5%	41	1%
Evergreen Forest	1	0%	0	0%	15	0%	20	0%	58	0%	0	0%
Mixed Forest	3	0%	0	0%	2	0%	44	1%	42	0%	0	0%
Shrub/Scrub	39	1%	0	0%	55	1%	47	1%	263	2%	7	0%
Herbaceous	96	3%	5	0%	286	6%	313	6%	332	2%	8	0%
Hay/Pasture	162	4%	0	0%	511	10%	271	5%	1250	9%	16	0%
Cultivated Crops	5	0%	0	0%	1	0%	1	0%	1	0%	0	0%
Woody Wetlands	152	4%	0	0%	34	1%	842	16%	222	2%	0	0%
Emergent Herbaceous Wetlands	0	0%	0	0%	0	0%	3	0%	0	0%	0	0%
Total	**3688**	**100 %**	**1777**	**100 %**	**4871**	**100 %**	**5106**	**100 %**	**13279**	**100 %**	**4863**	**100%**
Total Developed	**3129**	**85%**	**1764**	**99%**	**3872**	**79%**	**3389**	**66%**	**10316**	**78%**	**4775**	**98%**
Total Forest/Wetland	**207**	**6%**	**7**	**0%**	**83**	**2%**	**992**	**19%**	**962**	**7%**	**42**	**1%**

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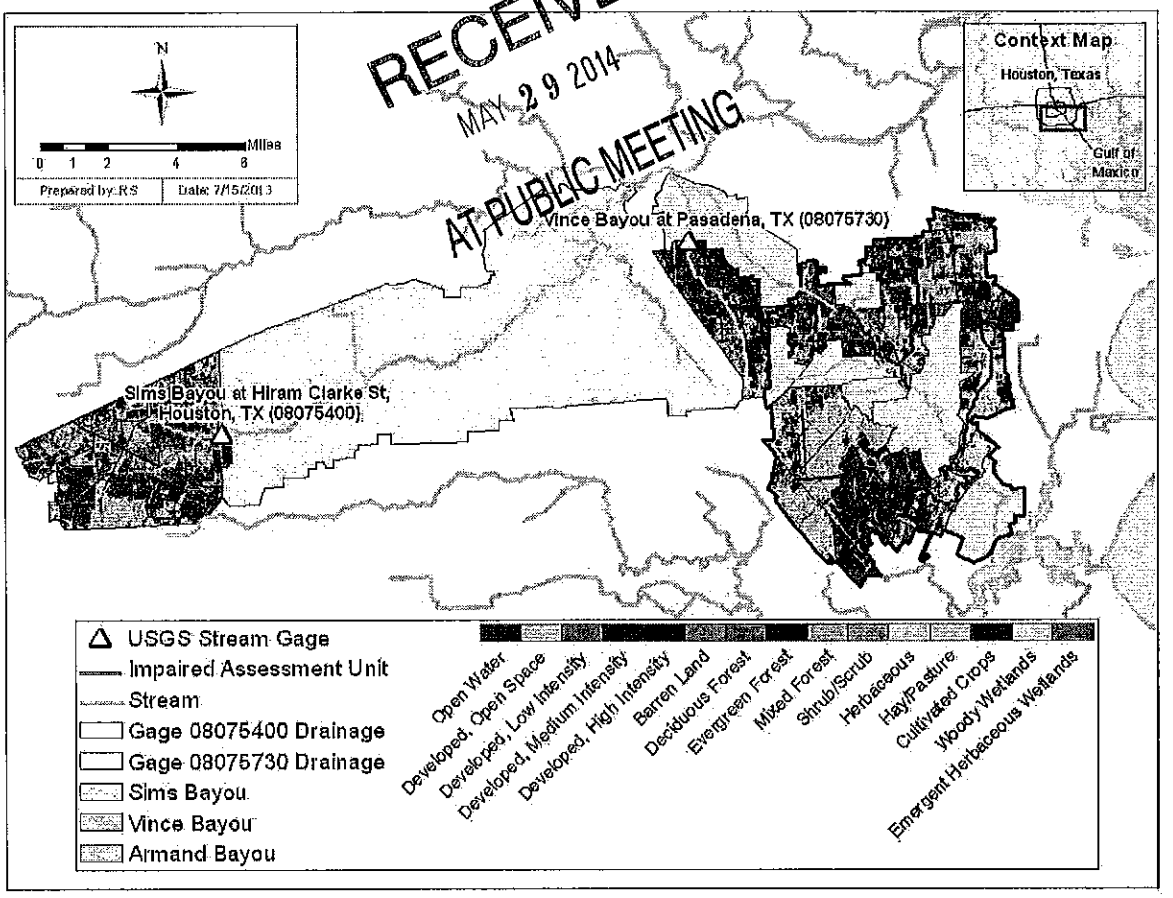

Figure F-7: USGS Gage locations

7.3 Model Development

7.4 Model form

A model is desired that will reliably predict an unknown flow in one location as a function of known flows from other locations with similar weather and land use. Such models can be linear, nonlinear or autoregressive (Linsley, Kohler and Paulhus 1982). In general, they take take the form:

$$Q_{u,t} = f(Q_{k,t}\, Q_{k,t-1}...)$$

Where:

$Q_{u,t}$= unknown flow time series
$Q_{k,t}$= known flow time series;
f(x) = linear or exponential function)

In general the time interval of the data is not important so long as the measurements are contemporaneous and equivalently averaged as there is no such thing as a truly instantaneous flow rate. In this case the input and output of the model are average daily flows. An initial investigation of gage correlation revealed a significant correlation (0.757) between the contemporaneous daily values of Sims and Vince Bayous and much lower values for flows lagged by one day. An analysis in log space produced significant but lower correlations thus a contemporaneous liner model was selected. Next, the model coefficients were selected based on the following model form.

$$Q_u=Q_kA^xD^yW^z$$

Where:

Q_u= unknown flow
Q_k= known flow;
A= Drainage area ratio
D= Developed area ratio
W= Wetland/Forest area ratio
x, y, z = parameters

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Note there is no constant term because it is assumed that the unknown flow is zero anytime the known flow is zero. This isn't the case because of treatment plant discharges in Sims Bayou but as discussed below, the gage data were adjusted to remove their effect.

7.5 Parameter Selection

The model parameters were selected using the following process:

- Reasonable model parameters were selected.
- The Sims Bayou gage was used as input to the model, and used to compare to the known flows at Vince Bayou.
- Similarly, the Vince Bayou gage was used as input to the model, and used to compare to the known flows at Sims Bayou
- Through an iterative process, the model parameters were refined to improve the fit for both Sims and Vince Bayou Gages.

A total of three wastewater treatment plants are located in Sims Bayou watershed. In order to properly use the USGS gage flows for the gage correlation approach, it was necessary to establish base flows without the plants. This was accomplished as follows:

- The monthly WWTP flows were obtained for each of the plants
- These flows were totaled to come up with a single WWTP flow for each month
- These flows were subtracted from the Sims Bayou USGS gage flow as shown in equation below.

$$Q_{baseflow} = Q_{USGSgage} - \sum_{\#wwtf}^{1} Q_{Avg.MonthlyWWTF}$$

- When $Q_{baseflow}$ resulted in a negative value, 30% of the USGS flow was used as a representative baseflow. This assumption is based on goodness of fit, best professional judgement and previous studies that showed baseflow is typically 20-40% of typical Houston bayou flows.

7.6 Final Model

The final model parameters used to estimate flows in Armand Bayou watershed were as follows:

- $X = 0.224$
- $Y = 0.274$
- $Z = 0.072$

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7.7 Goodness of Fit

A combination of visual evaluation, minimization of daily mean residuals and root mean square error were used to arrive at the model parameters that provided the best fit across a range of flow conditions.

To demonstrate the fit that was achieved using the above model, an example of the flow duration curve developed based on the USGS gage flow for Vince Bayou compared with the projected flows is presented in Figure 3. As shown in the Figure, the fit over the entire range of flow conditions is quite good. The model overpredicts a small amount at the very low flow conditions (i.e., less than the 10th percentile). There is also a small amount of overprediction in the high flows, with mid-range flows being slightly underestimated.

The mean residuals achieved for this comparison and root mean square error is presented in Table 3.

Figure F-3: Vince Bayou Gage Correlation Model Comparison

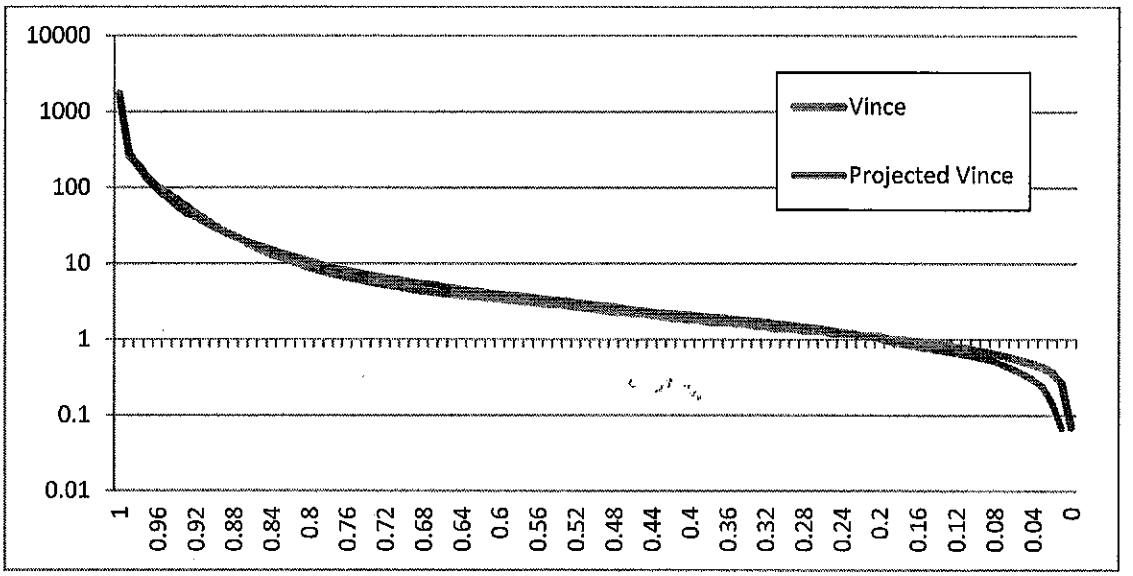

Table F-3: Gage Correlation Model Fit

Gage Number	Name	Mean Daily Residuals (cfs)	Root Mean Square Error (cfs)	No. Data Points
08075730	Vince Bayou at Pasadena, TX	-0.08	46.2	4,018

7.8 Model application

This approach was used to develop flow duration curves for the Study Area. The flow exceedance tables developed using the gage correlation model are presented in Table F-4.

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Table F-4: Flow Exceedance Percentiles (cfs)

Percentile	1113_A	1113_C	1113_D	1113_E
10	0.55	0.39	0.58	0.68
20	0.95	0.59	1.01	1.17
30	1.49	0.75	1.57	1.83
40	1.96	0.96	2.07	2.42
50	2.67	1.34	2.82	3.29
60	3.70	1.82	3.90	4.55
70	5.50	2.57	5.81	6.78
80	10.03	4.69	10.59	12.36
90	27.67	16.59	29.21	34.07
100	1439.94	909.62	1520.48	1773.36

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APPENDIX G
TIDAL MODEL CROSS-SECTIONS

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APPENDIX H
TRIBUTARY INFLOWS AND LOADS

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APPENDIX I
RUNOFF INFLOWS AND LOADS

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APPENDIX J
TIDAL PRISM MASS BALANCE MODEL

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APPENDIX K
METHOD FOR ESTIMATING FUTURE WWTF PERMITTED FLOWS

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Appendix K - Methodology to Project Permitted Flows for WWTFs Discharging to the Armand Bayou Watershed

The methodology used to predict future growth to 2050 is based on the approach used in the Clear Creek TMDL report. This appendix describes the procedure used for the growth prediction.

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Municipal Wastewater Projections

Municipal wastewater flow projections are based on the population difference between the 2010 census population and the 2050 population estimate from the Texas Water Development Board Region H Population/Demand Estimates (2013). If a WWTF was located within a city, the population growth for that city was used to project future WWTF flows; otherwise, county population projections were used. Table K-1 presents the population estimates for cities and counties in the Armand Bayou watershed. In the case of the two WWTFs in the Armand Bayou watershed, the only city of interest is the City of Houston.

Table K-1 Summary of Population Estimates for Armand Bayou Watershed

City	2010 U. S. Census Population	2020 Population Estimate	2050 Population Estimate	Percent Increase (2000-2050)
DEER PARK	32,010	34,255	38,853	21%
HOUSTON	**2,058,056**	**2,201,986**	**2,724,216**	**32%**
LA PORTE	33,800	34,345	35,785	6%
PASADENA	149,043	154,441	167,450	12%
TAYLOR LAKE VILLAGE	3,544	3,557	3,690	4%
WEBSTER	10,400	15,071	17,776	71%

Next, the per capita permitted flow for each city in the watershed was determined for 2010. To do this, permitted flows were obtained for all WWTFs within the cities. According to the City of Houston "Wastewater Facilities & Maintenance Section" website, the City of Houston treats an average of 277 MGD and is permitted to discharge a total of 564 MGD (2013). This value was used to calculate the per capita flow for the City as shown in Table K-2. Using the calculated per capita flow, the future permitted flow for 2050 was projected and is also included in Table K-3. It should be noted that this estimate is lower than would be expected based on typical wastewater generation estimates per person which is expected since portions of the City are served by non-City of Houston WWTFs. However, this estimate was determined to be acceptable for use in this analysis.

Table K-2 Per Capita Flow by City

City	Wastewater generated Per Capita (gallons per day)	Total permitted flow (MGD) - 2010	Total permitted flow (MGD) - 2050
Houston	2.74E-04	564	746.6

For WWTFs within city limits, the amount of the city's flow made up by the facility was determined. In both cases for the WWTFs in the Armand Bayou watershed, the entire WWTF contributing area was within the boundaries of the City of Houston. Therefore, the calculated future permitted flow for each plant is determined as follows:

- The percentage of City flow is calculated by taking the permitted flow for each plant divided by the current total City permitted flow
- The estimated 2050 Permitted flow is then the percentage of City Flow multiplied by the Total permitted flow for the City of Houston provided in Table K-2.

The results of this analysis are shown in Table K-3.

Table K-3 Summary of Future Permitted Flows by WWTF

TCEQ Permit	Permittee	Location of Outfall	2010 Permitted Flow (MGD)	% of City Flow	Estimated 2050 Permitted Flow (MGD)
10495-152	Metro Central WWTP	City of Houston	5	0.9%	6.62
10539-001	Robert Savely Water Reclamation Facility	City of Houston	10	1.8%	13.24

It should be noted that TCEQ Permit 03523-000 is associated with a City of Houston sludge plant which permitted as a no-discharge facility. Therefore, this facility was not included in future WWTF growth estimates.

Industrial Wastewater Projections

There is one NPDES/TPDES industrial permits within the Armand Bayou watershed, TCEQ permit 03029-000 which is issued to Equistar Chemicals Bayport Complex. This facility is permitted to discharge industrial stormwater and therefore, is not included in this analysis for wastewater projections.

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Summary

A summary of the future growth calculations and resulting value is presented in Table K-4.

Table K-4 Flow Projections

Permit #	Facility	Permitted Flow[a] (MGD)	Receiving Segment	Use Pop Projection from	GPCD[a]	Pop 2050[b]	% Flow In City[c]	Flow 2050[d] (MGD)	Adj Flow 2050[e] (MGD)
10495-152	Metro Central WWTP	5	1113B-01	City of Houston	2.74E-04	2,724,216	0.9%	6.62	1.618
10539-001	Robert Savely Water Reclamation Facility	10	1113B-01	City of Houston			1.8%	13.24	3.237

[a] *From Table K-2*
[b] *From Table K-1*
[c] *Permitted flow for facility/total permitted flow for the city in which the facility is located*
[d] *GPCD*Population 2050*%flow in city*
[e] *Flow 2050-Current permitted flow*

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Table K-5 Projected Flows by Watershed

Segment	Stream Name	Projected Permitted Flow (MGD)
1113_02	Armand Bayou Tidal	NA
1113A_01	Armand Bayou Above Tidal	NA
1113B_01	Horsepen Bayou	19.86
1113C_01	Unnamed Tributary to Horsepen Bayou	NA
1113D_01	Willow Springs Bayou	NA
1113E_01	Big Island Slough	NA

NA = Allocation not applicable at this time. There are no WWTFs discharging to the Assessment Unit.

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TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

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PLEASE PRINT

Name: Susan Parker

Mailing Address: 1702 Gunwale

Physical Address (if different): _____

City/State: Houston **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: mysparker23@gmail.com

Phone Number: 832-755-8165

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

How is Mr. Savely related to the company that will be putting the water on The OGC?

Please give this form to the person at the information table. Thank you.

(2)

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

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PLEASE PRINT

Name: Jean Peszko

Mailing Address: 1637 Beachcomber Ln., Houston, TX 77062

Physical Address (if different): —

City/State: Houston, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: tony-jean-peszko69@yahoo.com ✓

Phone Number: 281-488-2402

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mw

Jean M. Peszko Permit WQ0010539001

MOSQUITOES AND WEST NILE VIRUS

Comments against Permit WQ0010539001

Presented by:
Jean M. Peszko
1637 Beachcomber Lane
Houston, Texas 77062
Phone: 281-488-2402
tony_jean.peszko69@yahoo.com

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West Nile Virus (WNV) is a flu-like illness that can cause a high fever, encephalitis or meningitis, and infection of the brain and the spinal cord or their protective covering. Severe cases can result in mental retardation, motor impairment, or death. WNV has spread rapidly throughout North America.

WNV is a mosquito-borne disease transmitted mainly to birds, but also to animals and people. It has had a devastating effect on bird populations, especially among raptors like owls, hawks, crows, and jays; and has caused illness and death among humans. In 1999, at least 62 people became seriously ill, and seven of those died. During the year 2000, 21 human cases of WNV were reported in the United States, with two deaths. In 2001, there were 66 cases with nine deaths. In 2002, 4,156 human cases of WNV encephalitis or WNV fever were reported with 284 fatalities. During 2003, almost 10,000 human cases of WNV encephalitis and fever were reported from 46 states, with 264 fatalities. Since 2003, WNV cases and fatalities have continued to remain high. The yearly number of cases and number of fatalities have fluctuated depending on the weather conditions throughout the nation. It is expected that WNV will continue to be a serious disease threat well into the future.

West Nile Virus is spread to people by the bite of an infected mosquito. Mosquitoes first become exposed to the virus when they feed on birds that are infected with WNV. Once the mosquito is infected, it may transmit the virus to people or other animals when it bites them. People cannot get WNV from another person that has the disease. This disease will continue to spread among wild birds and mosquitoes.

Wetlands provide the perfect environment where an adult mosquito will lay her eggs in shallow water with abundant plant growth. Mosquitoes need just over a week to hatch and develop into adults that can transmit disease. Frogs, fish, birds, bats, and dragonflies cannot eat the majority of mosquitoes that breed. In fact, these mosquito eating creatures can create problems of their own for humans living in the vicinity of wetlands.

There are no effective avian, mammalian, amphibian, reptilian, or insect predators that will provide natural or biological control of mosquito populations. There are species of these predators that will feed on mosquito larvae and adults but not to the extent that they will control the population.

There are no bird species that are effective at controlling mosquito populations. Tree swallows are the most effective and adult and juvenile waterfowl species and migratory songbirds will eat larvae and may be dependent on them at certain times of the year. Purple martins eat insignificant numbers of mosquitoes.

Bats play an important role in the environment and can serve as agricultural pest control agents but they are not effective as mosquito control agents. There are no bat species that specialize in eating mosquitoes but there are bat species that have a portion of their diet consisting of mosquitoes (Big Brown Bat-nearly 0%, Little Brown Bat-much more likely to feed on mosquitoes). Due to their high metabolic rate, Big Brown Bats don't select mosquitoes as a food source. Mosquitoes don't swarm, they provide small amounts of energy, and they are more likely to be found in vegetation, not in areas where the bats will be feeding.

There are no amphibians or reptiles that are effective at mosquito control. The cricket frog, Chorus frog, and Spring peeper will eat mosquitoes but won't impact a population. Dragonfly larvae and aquatic beetles will feed on mosquito larvae, but won't control the population. At best these natural methods will control only 40% of the mosquito population

Installation of 39 acres of artificial wetlands in our community will create a mosquito haven and a health hazard. These artificial wetlands will be made possible by the two new sewage water outfalls that the Clear Lake City Water Authority (CLCWA) wants the TCEQ to approve to pipe 2.2 million gallons per day of treated sewage effluent into huge ditches the CLCWA will dig from our Old Golf Course. The mosquitoes that will breed in these wetlands will not be controlled by natural means and they cannot be sprayed with insecticide due to the federal wetlands designation. There will be nothing to stop the spread of WNV to our community.

Why must we have this public health threat in our community? Any value the wetlands may have to improve storm water quality will be more than offset by the WNV and other mosquito borne diseases they will allow to be spread. Common sense tells us that the best way to prevent mosquito borne disease in our community is to not artificially create the wetlands where mosquitoes can breed.

The TCEQ should not allow this discharge of treated sewage water into our old golf course. We who live in the Clear Lake community are counting on the TCEQ to save us from the health hazard posed by wetland mosquitoes. Please disapprove the CLCWA's permit WQ0010539001 for two new effluent water outfalls.

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Wetlands and mosquitoes - reducing the public health risks to visitors

Cameron E Webb and Richard C Russell, Department of Medical Entomology, University of Sydney and Westmead Hospital

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Mosquito *(Culex annulirostris) (Stephen Doggett)*.

Mosquitoes are a natural part of Australian wetlands and while the ecological role of these small, but occasionally abundant, insects has yet to be fully understood, there is strong evidence to suggest that birds, bats, frogs, fish and invertebrates make a meal of mosquitoes from time to time. Notwithstanding the impacts of nuisance-biting, the risks associated with the transmission of disease-causing pathogens are a major concern. Balancing the management of mosquito populations, wetland health and the subsequent impacts on people within and around wetlands can be a challenging issue. Do wetland managers have a duty

of care to protect tourists and recreational visitors from the risks of mosquito-borne disease?.

Ross River virus (RRV) and Barmah Forest virus(BFV) are responsible for approximately 5000 cases of human disease reported every year in Australia. However, as the symptoms (e.g. fever and rash, arthritic pain in the ankles, fingers, knees and wrist) can vary greatly between individuals, many infections go undiagnosed, resulting in a potentially greater impact on human health than the statistics report.

While neither (RRV) nor (BFV) is fatal, human illness caused by infection by the Murray Valley encephalitis virus (MVEV) can be potentially fatal. Only a small proportion of (MVEV) infections result in symptoms (e.g. fever, headache, vomiting, nausea, diarrhoea and dizziness) but in severe cases, encephalitis can occur and amongst those who survive, some residual mental or functional disability has been reported. For the closely related Kunjin virus (KUNV), there are fewer human cases reported, the disease is milder and there are no known fatalities resulting from the infection.

From an ecotourism perspective, the flooding of wetlands and increased bird activity that attract visitors can also increase local risks of mosquito-borne disease. In the case of (MVEV), the primary reservoir host is generally thought to be wading birds, with the freshwater mosquito Culex annulirostris considered the major vector. The activity of (MVEV) is generally considered to be endemic in the north-west of Australia while in the south-east, epidemics occur in association with the flooding of wetlands in the Darling/Murrumbidgee/Murray river systems of NSW, Victoria and South Australia that provides suitable conditions for both birds and mosquitoes.

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Fortunately, there have only been a small number of human cases of disease caused by (MVEV) in south-eastern Australia since the last large epidemic in 1974. The re-emergence of (MVEV) following flooding during the summer of 2010-11 has raised specific concerns regarding the potential impact on communities close to wetlands as well as visitors to the regions drawn by the prospect of visiting flooded wetlands and abundant bird life.

Historically, the incidence of disease in many areas is incredibly low due to the very low density of human populations and also because many of those individuals are lifelong residents and have developed immunity to these pathogens. Tourists visiting these areas, however, may be at a potentially higher risk given their lack of previous exposure to mosquito-borne pathogens and the immunity that brings, not to mention a lack of knowledge regarding mosquito-borne disease risk.

While there is a range of environmentally sensitive mosquito control agents registered for use in Australia, the broad scale nature of control activities that

would be required to reduce mosquito populations is not sustainable. Visitors to these wetlands, particularly during periods of abundant mosquito and bird activity, should be made aware of the risks and provided advice on suitable personal protection strategies. The use of bed nets when camping, wearing suitable clothing (i.e. long sleeved shirts, long pants and covered shoes) that provides physical protection from biting mosquitoes and the use of an effective mosquito repellent (i.e. a registered repellent containing the active ingredients diethyltoluamide or picaridin) will all assist in minimising the risks of mosquito-borne disease.

For further information contact cameron.webb@swahs.health.nsw.gov.au.

West Nile Virus is a mosquito-borne disease transmitted mainly to birds, but also to animals and sometimes people. It has had devastating effect on bird populations, especially among raptors like owls, hawks, crows, and jays; and occasionally has caused illness and death among humans.

Mosquitoes need just over a week to hatch and develop into adults that can transmit disease. The best way to prevent mosquito borne disease is to not artificially create the wetlands where mosquitoes can breed. Frogs, fish, bids, bats, and dragonflies cannot eat the majority of mosquitoes that breed. In fact, these mosquito eating creatures can create problems of their own for humans living in the vicinity of wetlands.

Mosquito Borne Diseases

Encephalitis & West Nile Virus
Encephalitis (sleeping sickness) and West Nile Virus are flu-like illnesses that can cause a high fever and inflammation of the brain. Severe cases can result in mental retardation, motor impairment, or death. Mosquitoes become infected while feeding on birds that harbor the virus. They can then transmit the virus to humans and animals.

Wetlands are environments where plant and animal life that requires water live. An adult mosquito will lay her eggs in wetlands when water becomes stagnant and weeds grow. Mosquitoes are blood-sucking insects. Their biting habits can be irritating and often make outdoor activities unenjoyable. Mosquitoes are important because some types can transmit organisms that can cause diseases in pets, domestic animals, and humans. Mosquitoes have four life stages: egg, larva, pupa, and adult. Immature mosquito stages need standing water to complete their lifecycle.

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A number of mosquito species, including the following, lay eggs in wetlands.

Encephalitis Mosquito (Culex tarsalis)
This mosquito can transmit encephalitis viruses (sleeping sickness), including West Nile Virus, to humans. Immature stages develop in wetlands, duck clubs, rice fields, irrigated crops, slow-moving streams, andalso in "backyard" water sources.

Coastal Malaria Mosquito (Anopheles hermsi)
This mosquito can transmit malaria to humans. Immature stages develop in wetlands, duck clubs, rain pools, and slow-moving streams.

Black Salt Marsh Mosquito (Aedes taeniorhynchus)
This mosquito is active during summer and early fall. Adult females are vicious and aggressive day and night biters and may disperse many miles from breeding sources

West Nile Virus is spread to people by the bite of an infected mosquito. The principal transmitter of West Nile Virus is the Northern House Mosquito (Culex pipiens). Mosquitoes first become exposed to the virus when they feed on birds that are infected with WNV. Once the mosquito is infected, it may transmit the virus to people or other animals when it bites them. Many birds can be infected with WNV, but crows and blue jays are most likely to die from the infection. Horses, too, are prone to severe WNV infection. People cannot get WNV from another person or horse that has the disease

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http://www.coastms.co.uk/resources/5b347a08-93d8-40f4-bddd-7b0e02da1fae.pdf

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Extension FactSheet

Veterinary Preventive Medicine, 1900 Coffey Road, Columbus, Ohio 43210

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Wetlands and West Nile Virus

What is West Nile Virus?

West Nile Virus (WNV) is a viral disease that can cause encephalitis or meningitis, infection of the brain and the spinal cord or their protective covering. Prior to 1999, the disease was found only in Africa, Asia, and southern Europe. Over the past several years, WNV has caused disease in the United States. In 1999, at least 62 people became seriously ill, and seven of those died. Since then, WNV has rapidly spread throughout North America. During the year 2000, 21 human cases of WNV encephalitis were reported in the United States, with two deaths. In 2001, there were 66 cases with nine deaths. In 2002, 4,156 human cases of WNV encephalitis or WNV fever were reported with 284 fatalities. During 2003, almost 10,000 human cases of WNV encephalitis and fever were reported from 46 states, with 264 fatalities. Since 2003, WNV cases and fatalities have continued to remain fairly high. The yearly number of cases and number of fatalities have fluctuated depending on the weather conditions throughout the nation. It is expected that WNV will continue to be a serious disease threat well into the future.

West Nile Virus is spread to people by the bite of an infected mosquito. The principal transmitter of West Nile Virus is the Northern House Mosquito (*Culex pipiens*). Mosquitoes first become exposed to the virus when they feed on birds that are infected with WNV. Once the mosquito is infected, it may transmit the virus to people or other animals when it bites them. Many birds can be infected with WNV, but crows and blue jays are most likely to die from the infection. Horses, too, are prone to severe WNV infection. People cannot get WNV from another person or horse that has the disease.

Year	United States		Ohio	
	Cases	Deaths	Cases	Deaths
1999	62	7	0	0
2000	21	2	0	0
2001	66	9	0	0
2002	4,156	284	441	31
2003	9,862	264	108	8
2004	2,539	100	12	2
2005	3,000	119	61	2
2006	4,266	177	48	4
2007	3,623	124	23	3

Continued spread of this disease among wild birds and mosquitoes is anticipated. State, federal, and local agencies are working together to address the health risks of WNV to Ohio families and their animals. Ohio public health officials test for WNV in many species of birds, mosquitoes, and horses. Once infected areas are identified, mosquito control efforts are increased in those areas to protect people from the disease.

Prepared by:

WNV West Nile Virus WORKGROUP

Ohio Department of Health • Ohio Department of Agriculture • Ohio Department of Natural Resources
The Ohio State University • Ohio Environmental Protection Agency • Association of Ohio Health Commissioners
Ohio Mosquito Control Association • Ohio Environmental Health Association • United States Department of Agriculture

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If I'm hiking or walking in an area with wetlands, how can I protect myself from West Nile Virus infection?

WNV infections usually peak in late summer and early autumn, before mosquito numbers are reduced by hard freezes. If you hike or walk out of doors during this period, you should wear long-sleeved shirts, long pants, and apply insect repellents to clothing and skin, following the label directions, to prevent mosquito bites.

What is the value of a wetland?

Wetlands are among the most biologically productive habitats in the world. Before European settlement, Ohio's wetlands covered 18.9% (5 million acres) of the state. As settlers moved west, they drained the wetlands for timber and farming, thus eliminating 87% of the state's original wetlands. Wetland-dependent wildlife species have been severely impacted by this significant reduction in the amount and quality of wetland habitat. Wetlands are highly productive. They warm quickly in spring and produce abundant quantities of food for amphibians, reptiles, shorebirds, migrating birds, and waterfowl. Even small sites, much less than an acre, can produce hundreds of frogs, toads, and salamanders. They also provide critical links to other habitat types and wildlife populations.

Should wetlands be drained to control mosquitoes?

Because the *Culex* mosquito can breed in very small amounts of water, eliminating temporary standing water in plastic containers, discarded tires, or other water-holding containers around one's property can greatly reduce breeding areas. Any stagnant water in rain barrels, irrigation ditches, clogged gutters, backyard home septic systems, and road-side ditches can serve as breeding sites. The difference between these water-holding places and wetlands is the presence of mosquito-eating predators. Wetlands are home to a host of mosquito-eating beetles, backswimmers, water striders, dragonfly larvae, etc., making them significantly less ideal breeding sites for *Culex* mosquitoes.

Can wetlands be drained or are there regulations that protect them?

Wetlands are afforded protection from draining under the authority of the Ohio Environmental Protection Agency in several sections of Ohio Administrative Code 3745. Under this authority, the hydrology necessary to support the biological and physical characteristics naturally present in wetlands shall be protected to prevent significant adverse impacts on the wetlands. A person cannot alter the water levels of the wetland, which also includes groundwater recharge and discharge.

What is the status of WNV in Ohio?

WNV has been confirmed in Ohio every year since 2001. Infected mosquitoes, birds, horses and humans have been found in all Ohio counties. Therefore, the virus is present throughout the state. Contact your local health department in your area, or visit one of the web sites.

For the current status on WNV in Ohio and for more information, you can log on to the following web sites:

The Ohio State University:
http://vet.osu.edu/1516.htm

Ohio Department of Health:
http://www.odh.ohio.gov/odhprograms/idc/zoodis/wnv/wnv1.aspx

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Keith L. Smith, Ph.D., Associate Vice President for Agricultural Administration and Director, Ohio State University Extension

TDD No. 800-589-8292 (Ohio only) or 614-292-1868

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Jean M. Peszko Permit WQ0010539001

http://citizenreviewonline.org/west-nile-virus-wetlands-and-mosquitoes-cause-and-effect/

WEST NILE VIRUS- WETLANDS AND MOSQUITOES – Cause and Effect

from Pearl Rains-Hewett

Posted 8/23/2012

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FOX NEWS - by elizabeth prann - 37 minutes ago

... for *West Nile Virus*, with 41 deaths and more than 1100 cases reported. ... there were only 25 cases reported *nationwide* this time last month. ... Experts are not willing to pin-point one specific reason for the outbreak of *2012*.

1989-2012 Increased wetlands = increased mosquito vector borne diseases

Since 1989 the Corps and EPA have implemented the § 404 program to achieve a Presidential goal of "no net loss" of wetlands.

ADMINISTRATION PROJECTED 4.8 MILLION ACRES OF WETLANDS BY 2009

The Centers for Disease Control said Wednesday this is shaping up to be the worst year ever for West Nile Virus infections and deaths in the U.S. The virus, transmitted by mosquitoes, is now to blame for 41 deaths across the country with more than 1,100 people infected — and those numbers are expected to climb.

"There have been more cases reported to us at this time of year than ever before," said Dr. Lyle R. Petersen, director of Vector-Borne Infectious Diseases for the CDC. "This will be amongst the biggest or the biggest break we've had in the United States."

On Earth Day 2004, the President George Walker Bush announced a new initiative to go beyond "no net loss" of wetlands and attain an overall increase in the quality and quantity of wetlands in America.

Specifically, the Administration has projected that an additional 1.5 million wetland acres will be created, improved, or protected between Earth Day 2006 and 2007, with three million acres being obtained by 2009.

These figures are in addition to the 1,797,000 acres of wetlands that have already been restored, created, protected, or improved since the onset of the 2004 initiative.

The number of cases has risen dramatically in the past few weeks. CDC officials say numbers are alarming given there were only 25 cases reported nationwide this time last month. The only states that do not have reported cases of the virus are Hawaii, Alaska and Vermont.

Texas officials are working closely with the CDC to get a handle on the outbreak. Dr. David Lakey, commissioner for the Texas Department of Health, said his state is the center of the outbreak. Statewide, there are 586 reported cases with 21 deaths. Lakey said there were four more reported cases and one additional death yesterday, but those have not officially been confirmed.
Read more: http://www.foxnews.com/health/2012/08/22/cdc-alarming-increase-seen-in-west-nile-cases/#ixzz24J5JZCjU

West Nile Virus Kills 41 People in Biggest US Outbreak

West Nile virus has killed 41 people in the U.S. and infected 1,118 in the biggest outbreak of the mosquito-borne disease since it was first confirmed in the country 13 years ago.

CAUSE AND AFFECT?

1989-2012 Increased wetlands = increased mosquito vector borne diseases.

Pearl Rains Hewett

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Jean M. Peszko – Permit WQ0010539001

MOSUITOES IN WETLANDS CAUSE HEALTH HAZARDS

The plans of the Clear Lake City Water Authority to install 39 acres of artificial wetlands using effluent water on the Old Golf Course in Clear Lake City will create a mosquito haven and a health hazard to our community. Mosquitoes will have the perfect environment to quickly breed by laying their eggs in the wetlands created by 2.2 million gallons of treated sewage water flowing daily through the ditches on the Old Golf Course. These wetland mosquitoes will not be able to be controlled by the spraying of insecticides because the wetlands will be designated a federal wetlands. Natural predators of mosquitoes like frogs, fish, bats, birds and dragonflies will not be able to eat the majority of mosquitoes that will breed in these wetlands. With this infestation of mosquitoes in our densely populated community, a life threatening danger presents itself. West Nile Virus a mosquito-borne disease transmitted to birds and then to humans via mosquitoes will become a threat to the health of Clear Lake City residents especially those who are over 50 like me and those who have compromised immune systems. West Nile Virus, a flu-like illness, can cause encephalitis, meningitis, infection of the brain and spinal column and in some cases even death. Records compiled by the Center for Disease Control for 2012 show that the state of Texas had over 1,868 cases of West Nile Virus reported which resulted in 89 deaths. Wouldn't even 1 death in Clear Lake City from West Nile Virus originating from mosquitoes in the artificial wetlands be one too many? The TCEQ should not allow this discharge of treated sewage water into our Old Golf Course which will create a haven for mosquitoes and the diseases they transmit. We residents of Clear Lake City are counting on the TCEQ to save us from this health hazard posed by wetland mosquitoes breeding in treated sewage water.

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Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 30, 2014 12:57 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 7-7-14

From: dougpeterson@earthlink.net [mailto:dougpeterson@earthlink.net]
Sent: Sunday, June 29, 2014 9:53 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Douglas Peterson

E-MAIL: dougpeterson@earthlink.net

COMPANY:

ADDRESS: 2118 CHERRYTREE RIDGE LN
HOUSTON TX 77062-3651

PHONE: 2812867631

FAX:

COMMENTS: As a Clear Lake resident living in a neighborhood with drainage ditches on north and south both flowing from the CLCWA flood control project and into the Horsepen Bayou east of our neighborhood, I write in strong support of the CLCWA Exploration Green project and it's permit amendment to send "reuse" water into site and water flowing on three sides of our neighborhood. Discharging the water into in the detention ponds will provide a greater area of water there, will create a steady flow mixing and moving the run-

off water than drains naturally int area into the drainage ditches and H pen Bayou, and maintain a minimal water level for ponds and environmentally enhancing wetlands. Moreover, this is a good use of the reuse water to dilute the dirtier run-off water and expose to sun light. It is well-known in the Clear Lake area that reuse water is used in multiple locations for irrigation of sub-division common areas, golf courses including the defunct Clear Lake golf course and the Bay Oaks Country Club Golf Course and the University of Houston-Clear Lake campus. All these locations have residences directly adjacent to them and there has never been a complaint about "sewer water" use, "sickening odors," or "dangerous, deadly" threats as a few now suggest. In fact, these extreme allegations have not been brought up or been actual problems in the many years that the reuse water was used to water the golf course directly abutting many homes along it's boundaries. This is not surprising considering the quality of CLCWA's reuse water. The CLCWA reuse water named in the CLCWA permit amendment is very high quality just a single step from being potable water. In fact, according to publicly available Discharge Monitoring Reports (DMRs) the monthly 30-day geometric mean bacteria counts in the CLCWA reuse water are less than 10% of the maximum allowed by the permit. Moreover,the CLCWA reuse water has far less bacteria than the receiving water (Horsepen Bayou) and all other waters of the Armand Bayou watershed according to the April 2014 TCEQ study of the Armand Bayou watershed. It is noteworthy, that the local residents haven't complained about the drainage ditches and Horsepen Bayou (also very close to homes), despite their actually being at significantly lower quality water. As the TCEQ is well aware of, reuse water is being used more and more as water resources become less available. And certainly, water is reused time and again as water is taken from surface sources such as rivers, treated, used and sent through sewer pipes to treatment plants, released to be mixed with surface water to be treated used again and again. The extreme complaints about reuse water in Exploration Green are unfounded, grossly exaggerated, and apparently unacquainted with the outstanding results of modern water treatment practices and technology in the United States. Many, perhaps most Clear Lake residents are quite knowledgeable about advances in water recycling used aboard NASA's International Space Station which has a closed loop water system enabling our astronauts to drink recycled water without concern or health threat. It is surely fitting that Exploration Green too use recycled water in its systems. It should also be noted that the planning and design of the Exploration Green facility has been joint project of the Clear Lake City Water Authority; Lockwood, Andrews and Newnam a highly regarded engineering firm in Houston, SWA Architecture Group an award-winning architecture firm and multiple hydrologists. This project is meeting very high standards, and in fact won the H-GAC Planning and Design Award for 2014, honored by the Houston-Galveston Area Council. Finally, the Clear Lake City community is strongly in favor of the Exploration Green flood control project, especially as shown by results of the recent, May 10, election of two CLCWA board members who strongly supported the projects against several opponents who vocally opposed the project after a well-publicized campaign. The election results 75% for Exploration Green supporting candidates and 25% for those opposing the project, were an over-whelming mandate for Exploration Green, including the use of reuse water in the project which was a primary topic of the campaign discourse. In closing, I hope and expect that the TCEQ will award the CLCWA permit amendment based on the technical data that supported the tentative approval of the amendment. The facts there, rather than innuendo, threats and politics, certainly warrant a quick approval of the amendment in order that the more than 100,000 Clear Lake area residents gain the benefits of the Exploration Green flood control, recreation and conservation area without further delay.

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TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

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PLEASE PRINT

Name: DOUGLAS PETERSON

Mailing Address: 2118 CHERRYTREE RIDGE LN.

Physical Address (if different): _____

City/State: HOUSTON, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: ~~dougp~~ dougpeterson@earthlink.net

Phone Number: 281-782-2721

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? EXPLORATION GREEN CONSERVANCY

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MW

CLCWA Permit Number WQ0010539001 Comments by Doug Peterson, dougpeterson@earthlink.net, 281.782.2721 cell

Personal – Our family of five lives in a sub-division with the two streams coming out of the CLCWA property on two sides of our neighborhood and Horsepen Bayou on the third side, so we very much value the Exploration Green flood detention capability. The opponents claim that outflow to the site would be 10 M gallons a day of dangerous sewer water – not the case – but considering the low quality of the current water flowing through those streams, we'd be pleased if that much reuse water WAS coming through streams because it would considerably dilute the current dirty water streams.

Storm Water Detention Project – The Clear Lake City Water Authority's vision to create the 200 acre Exploration Green flood detention, recreation and conservation area in the heart of the Clear Lake community is highly commendable, and the project is very popular. The recent CLCWA election for two board members was a blowout, with the two pro-Exploration Green candidates polling at about 75% of vote while the opponents got about 25% or much less.

Flood Control/mitigation - The Clear Lake City master planned community was developed in the 1960s, prior to serious consideration to storm water detention and flood mitigation. The CLCWA storm water detention plan will mitigate street flooding in the Clear Lake Area. The rainfall patterns in the Clear Lake area more closely match those of coastal counties such as Galveston and Brazoria Counties, necessitating the 12" flood planning requirements and not the Harris County standard 6". Considering record rainfalls in this area, i.e., the record rains in Alvin, drives the needed size of lakes and therefore the amount of reuse water. In a 13 hour period last October just 4 inches of rain caused major flooding in Clear Lake area streets.

Exploration Green and Reuse water - The CLCWA is requesting outflow of reuse water into the planned detention areas to provide flowing water and water for the wetlands which will help clean water. The project master plan includes wetlands that require water year-round to maintain the environmentally friendly ecosystem.

Project Wetlands Restoration - The CLCWA needs the operational flexibility to flow water through the property to minimize water stagnation and mitigate growth of bacteria. Texas A&M Texas Coastal Watershed Program is working with TCEQ Office to provide grant money for wetlands restoration. Water needs to be pumped to the storm water wetlands facility to preserve wetlands during dry periods. This will help filter storm water and aid mosquito control by preservin habitat for species that feed on mosquitos and their larvae.

Existing Use of Reuse Water - The reuse water has been used in the past to irrigate the Clear Lake golf course, is currently used to replenish ponds on the golf course property. CLCWA currently delivers reuse water to the University of Houston – Clear Lake and Bay Oaks Country Club for irrigation. The CLCWA has provided the same reuse water for irrigation to three primary customers for over twenty years without reported incident. Most recently in CY 2013 CLCWA's maximum and average reported bacteria values were about 1/17 and 1/35 of TCEQ Type 2 Reuse Water Standard and Permit Limit respectively and half or a quarter of the TCEQ Type 1 Reuse Water Standard. This is not just reuse water, it is very clean reuse water!

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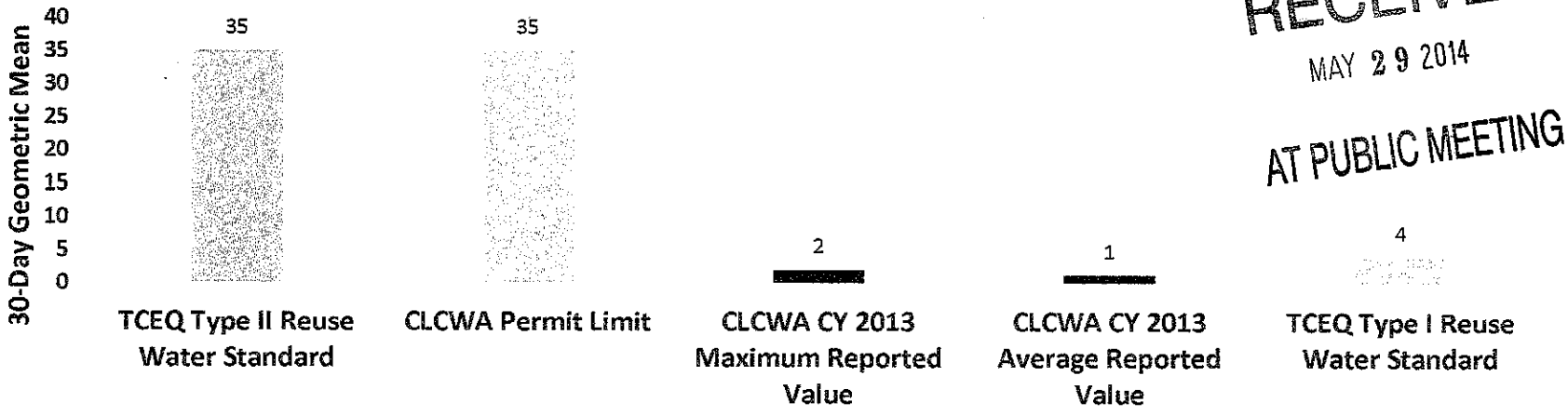
Enterococci Bacteria Colonies per 100 ml

(CLCWA data based on CY 2013 Discharge Monitoring Report (DMR) Data)



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Better than Receiving Waters - The reuse water that the amended permit will allow to flow into the detention lakes is far cleaner than the receiving water. In addition to far exceeding water quality standards, the water was colorless and odorless.

Segment Name	Assessment Unit	Station ID	[illegible]	[illegible]	[illegible]	[illegible]
Armand Bayou Tidal	1113_02	11503	Armand Bayou Tidal at Bay Area Blvd north of NASA at middle of median between 2 bridges eastern shore	**EC**	**271.4**	35
				ENT	**42.8**	110
Armand Bayou Above Tidal	1113A_01	11404	Armand Bayou at Genoa-Red Bluff Rd NE of Ellington AFB	EC	204.6	111
		11405	Armand Bayou at Fairmont Parkway along median at midpoint between bridges	EC	56.3	5
		17488	Armand Bayou Above Tidal 77 meters upstream of Dedman Street/West Pasadena Blvd in southeast Houston	EC	1,179.3	82
Horsepen Bayou	1113B_01	11409	Horsepen Bayou at Bay Area Blvd north of NASA	**EC**	**205.8**	37
				ENT	**58.4**	87
		17317	Horsepen Bayou at Middlebrook Dr. in southeast Houston	**ENT**	**64.7**	31
Unnamed Tributary to Horsepen Bayou	1113C_01	17485	Unnamed Tributary of Horsepen Bayou Tidal at Penn Hills	**EC**	**215.1**	108
Willow Springs Bayou	1113D_01	17487	Willow Spring at Bandridge Rd in southeast Houston	EC	744.0	109
Big Island Slough	1113E_01	17486	Big Island Slough at Hillridge Rd in southeast Houston	EC	608.7	105

CLCWA enterococci levels far less than receiving waters and other TCEQ-Monitored segments of the Armand bayou watershed.

Use of Reuse Water is Commonplace – Opponents revel in calling this stinking, dangerous sewage water, but they ignore that nearly all water comes from sources that require extensive treatment. It isn't unusual or dangerous. Use of reuse water for a variety of purposes is commonplace and it is certainly not the "extremely dangerous" sewer water that several Exploration Green opponents claim. Not only is reuse water being used for drinking water in some cities across the country as well as in Texas, but some areas like the Santee Lakes in San Diego have been using recycled water for decades for lakes in recreational sites. "Every drop of water that's being consumed in Houston has been through the wastewater treatment plants in Dallas and Fort Worth," said Andy Sansom, director of the Meadows Center for Water and the Environment at Texas State University in a Texas Tribune article. Wichita Falls, Texas is looking at a direct use of reuse water for drinking water. Several references: http://www.texastribune.org/2013/10/16/reused-wastewater-key-trinity-rivers-survival/ http://www.kitsapsun.com/news/2014/may/09/wastewater-drinking-water-north-texas-city-working/#axzz32y6VMUG0 http://tbo.com/list/news-opinion-commentary/reuse-is-wise-use-20140518/

Clear Lake City Water Authority is an outstanding government agency - It provides high quality service at low cost that meets the needs of the community. H quality service and SUPERIOR water quality ratings from State of Texas with some of the lowest water and sewer rates in Texas. CLCWA Waste Treatment Compliance History Rating of 1.91 is close to the High ratings of 0.10 and far below the Unsatisfactory levels at 55 and above.

CLCWA has an excellent compliance record - The CLCWA is in excellent compliance with applicable permit and regulatory limits. The CLCWA has an above average to exceptional compliance record relative to other municipal water districts in Harris County/TCEQ Region 12. Existing permit effluent limitations mirror the requirements for Type 2 Reuse Water found at 30 TAC §210.33(2). In fact, CLCWA effluent typically meets the requirements for Type 1 Reuse Water 30 TAC §210.33(1)

Property Values - Repurposing the former golf course with modern green belts, water detention lakes and other amenities will increase property values in the area, bringing a modern amenity to the aged sub-division. Recently built sub-divisions such as Victory Lakes just south of Clear Lake has homes up to and above $.5 M. Upscale developments such as Cross Creek in Katy have similar central water area for "polishing" water for "natural living" with home up to $1 M and higher.

Community Support - The opposition does not represent the community; in fact represents only a very small minority. There are many, probably a majority of residents next to the site that can't wait for the new lakes to be developed. The candidates that campaigned on support of the Exploration Green Project in th 05/10/2014 CLCWA Board Election defeated the candidates opposed to the project by a margin of 3-to-1. The community supports this project. The election results show broad-based community support for the Exploration Green project, of which the CLCWA permit amendment to support the wetlands is an important part.

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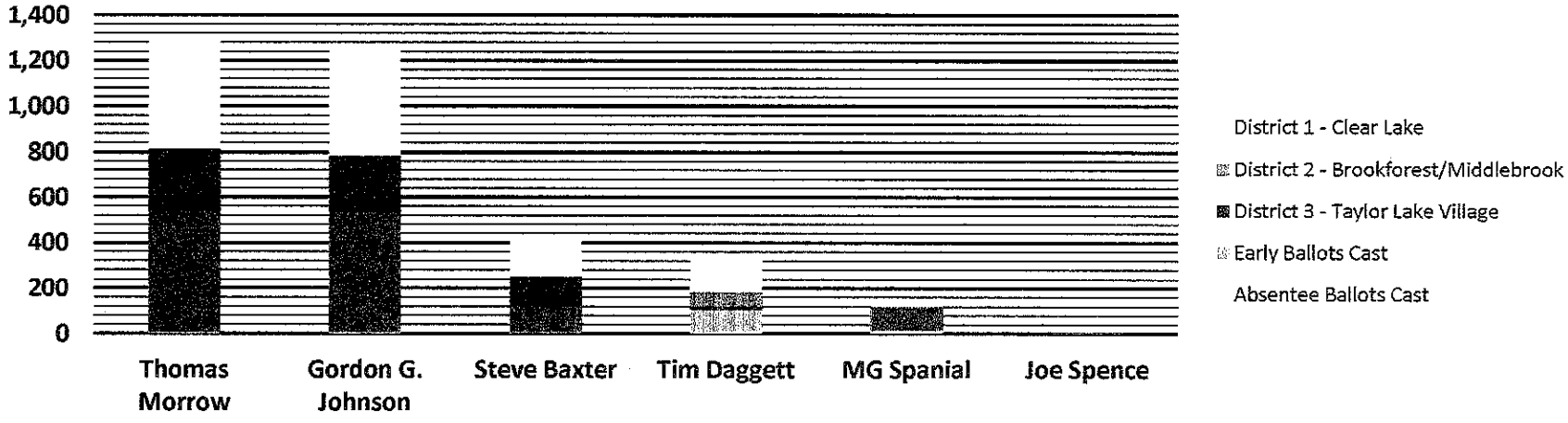
Clear Lake City Water Authority 05/10/2014 Election Results (Unofficial)



In closing – Our family strongly supports the Exploration Green development and most certainly the introduction of more reuse water into the local streams. This, along with the positive impact of the new wetlands, will help clean the local streams including Horsepen and Armand Bayous. Our family looks forward to the 200 public green space rather than the oft proposed development of apartments and condos which would exacerbate flooding, dirty run-off, environmental issues and other issues of high density development.

Exploration Green Conservancy – a non-profit created by volunteers like me strongly support the Exploration Green project and have been working tirelessly for several years to make the CLCWA vision into a reality for the citizens of the Clear Lake area. I serve as vice-chair of the Exploration Green Conservancy.

Thank you for your attention to the benefits of the Exploration Green storm water detention, recreation and conservation area.

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Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 01, 2014 7:44 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Note: Comment is attached to Enforcement item in error. This is a comment on the pending permit.

MWD 9/4/24

From: thomas.piotrowski@gmail.com [mailto:thomas.piotrowski@gmail.com]
Sent: Tuesday, September 30, 2014 6:19 PM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Thomas F Piotrowski

E-MAIL: thomas.piotrowski@gmail.com

COMPANY:

ADDRESS: 1906 CARRIAGE BROOK WAY
HOUSTON TX 77062-4787

PHONE: 8322844262

FAX:

COMMENTS: My wife, Marly Denison, and I, Tom Piotrowski own 1906 carriage brook way in Bay Forest and also we own 1413 Ramada that butts up to the old golf course. We really want to see the dirt fly soon! We are outdoor and wildlife enthusiasts and believe that Exploration Green could become an area hub for runners, walkers, cyclists and plain nature lovers. We realize that it will take years for the full plan to come to fruition and we are willing to do the wait. Please expedite your approvals. Thanks.

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

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Name: Pat Powell

Mailing Address: 1811 Reseda Drive

Physical Address (if different): _____

City/State: Houston TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: patriciakaypowell@comcast.net ✓

Phone Number: 281-488-5017

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.** ✓

☑ DID NOT SPEAK
I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

me

Memo To: Texas Commission on Environmental Quality
Date: May 29, 2014
From: Patricia Kay Powell
1811 Reseda Drive
Houston TX 77062
281-488-5017
Subject: Clear Lake City Water Authority Request
Permit No. WQ0010539001

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In urging the TCEQ to reject this Water Authority permit request, I cite your instructions to parties who wished to have your body conduct a "Contested Case Hearing." You required:

1. "The location and distance of your property/activities relative to the facility"
2. "A specific description of how you would be adversely affected by the facility in a way not common to the general public"

the very issues leading to my plea --- NIOBY! NIOBY! NIOBY!

Resistance to unwanted uses of land often results in protests now so common that familiar acronyms capture complaints typically summarized as "Not In My Back Yard" (NIMBY) for projects deemed inappropriate or harmful in a setting near one's residence, workplace, or in the general vicinity of an area one calls "home." There is also "Not In Anyone's Back Yard" (NIABY) which is applied to land usage complainants consider so hazardous and harmful that it really should not be sanctioned in any place. In both of these examples, protests are generally about land usage in someone's metaphorical or figurative "back yard." By way of contrast, this protest to TCEQ regarding unwanted CLCWA land use is PLEASE, NO! NOT IN OUR [actual, literal] BACK YARD(S)

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MAY 29 2014
AT PUBLIC MEETING

When the original planners of this unique community began their creative venture, more than a half century ago, they had the luxury of incorporating all sorts of clever ideas on the drafting paper before them---maybe wild, natural wetland marshes and bogs, or high volume water and sewer works, or, or ... who knows what else---because they were working not only with entirely blank pages, but also with completely bare, undeveloped land (and lots of it) The new crop of Clear Lake City planners deserve credit for all their forward-looking ideas, but they have chosen to ignore one enormously significant difference between the current planning environment and that of their visionary predecessors: a highly inconvenient truth. In fact, they have decided to deny the presence and interests of approximately 400-or-so inconvenient truths. All alterations now contemplated by CLCWA in its extreme makeover plans for Clear Lake City's original green belt/golf course, will be made at the very center, in the heart-and-core, of a fully developed, vibrant, mature residential community. For all who own homes adjacent to that green belt, these changes will negatively impact our extended, shared back yard, an inviting, open-to-all space that often flows without any visual or physical obstruction from one individual's back door, across unbroken green, to the back doors of our neighbors. It was no coincidence that this very Texan of a municipal up-and-comer was promoted, early-on, as "America's Home Town." It invited Americans from across our nation to congregate here and join in as part of a world-changing, futuristic adventure into space, while, at the same time, enjoying an old-as-the-hills, easy-going, neighborly, small town, Texas lifestyle. That was our origin; it has remained our legacy.

We who made the most significant single purchases of our lives on property immediately surrounding the original CLC golf course, made

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AT PUBLIC MEETING

a trade-off, receiving a benefit not available to other Clear Lake City homeowners, at a cost other residents are not required to pay. In exchange for the pleasure of having our personal property extend beyond official borders, to seamlessly join the big, communal yard out back, we gave up the option of providing extra privacy and protection for our homes, families, pets, and possessions, in the way other homeowners secure theirs (i.e., with strong, tall, back walls or fences) Instead, we were---and are--- allowed only the questionable benefit afforded by a fence barely tall enough to keep a toddler in or an alligator (but certainly not a coyote) out, unless we sacrifice a sizeable chunk of yard to comply with fence set back provisions. While public officials feel free to make drastic changes in the form and function of territory under their jurisdiction, with no regard for the impact those alterations have on adjacent land, we adjacent landowners remain bound by restrictions we assumed upon purchase of our homes. We purchased these homes intending to live up to our commitments, and in the reasonable, good faith expectation that the green belt to which our properties are inextricably linked would be maintained and administered with reciprocal, reliably responsible stewardship.

We homeowners continue to keep the faith and our commitments; we have followed the rules and observed the restrictions by which we and our properties are bound. We should be able to rely upon public officials to carry out their obligations with integrity and a genuine appreciation for what Clear Lake City is, and how we came to be. Our community has a proud and unique history. The citizenry should be able to trust our leaders to faithfully preserve our past and its promises, with as much energy and determination as they devote to charting its bright future.

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MAY 29 2014
AT PUBLIC MEETING

No drastic re-planning, repurposing, or reshaping of our green common should be permitted, so long as those of us with adjacent properties remain tied to the legally binding responsibilities and restrictions that the purchase of our homes entailed. Like other major CLCWA proposed green belt projects, this greatly expanded wastewater accommodation plan represents an egregious breach of trust, regardless of its legality. I respectfully implore you to just say "NO!" to the introduction of increased wastewater capacity and volume into the back yard(s) of homes bordering the old golf course, in the interest of protecting homeowners' health and safety, while also protecting the financial value of our property.

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MAY 29 2014
AT PUBLIC MEETING

A QUALITY ENVIRONMENT

A Quality Environment? What might that really be?
For my dear next-door neighbor of 40 years and me
It would require the spreading, sheltering aged oak out back,
A sheer delight, neither hers nor mine, but yours and ours to see.

A Quality Environment? What magic might it hold?
Relaxing walks on verdant carpet green toward sunsets crimson-gold,
Or leaving beaten paths to meet friends waving from their decks . . .
The simple sorts of pleasures, prized and shared and never, ever old.

A Quality Environment? What might be its goal?
Maybe to be a place where children can play free of any costly toll
Charged 'gainst their health or future through dangers, dreadful small;
A place to nurture all within its reach, in body, mind, and soul.

A Quality Environment? It matters such a lot . . .
To how we live and learn and grow, and where we find that perfect spot
To settle down, build homes and families and lives,
Secure and safe, full of wonder and gratitude for everything we've got.

A Quality Environment? Who on earth would throw it all away?
No one possessed of pride in Clear Lake City's storied yesterday;
No one who values what we've come to be these 5-some decades later;
Not we, who stand against an odious effluent incursion, strong, to say:

Please, Please — Do NOT Permit Anybody to this body to simply flush our quality environment away
NOT HERE! NOT NOW! NOT THEN!

NO HOW! NO WAY!

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 02, 2014 9:07 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MW 07424

From: patriciakaypowell@comcast.net [mailto:patriciakaypowell@comcast.net]
Sent: Thursday, May 29, 2014 4:08 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Patricia Kay Powell

E-MAIL: patriciakaypowell@comcast.net

COMPANY:

ADDRESS: 1811 RESEDA DR
HOUSTON TX 77062-6018

PHONE: 2814885017

FAX:

COMMENTS: A QUALITY ENVIRONMENT A Quality Environment? What might that really be? For my next door neighbor of 40 years and me It must include the two stately, spreading, sheltering, oak trees out back, A sheer delight---neither hers nor mine---but yours, and ours to see. A Quality Environment? What magic might it hold? Relaxing walks on verdant carpet green, toward sunsets crimson-gold, Or leaving beaten paths to meet friends waving from their decks . . . The simple sorts of pleasures, prized and shared, and never, never old. A

MW

Quality Environment? What migl its goal? Maybe to be a place where idren can play free of any costly toll Charged 'gainst their health or future, by dreadful dangers deadly small; A place that nurtures all within its reach, in body, mind, and soul. A Quality Environment? It matters such a lot! To how we live and learn and grow, and where we find that perfect spot To settle down, build homes and families and lives, Secure and safe and full of wonder and gratitude for everything we've got. A Quality Environment? Who on earth would throw ours all away? No one possessed of pride in Clear Lake City's storied yesterday; No one who values what we've come to be these five rich decades later; Not we who stand strong against CLCWA's odious effluent incursion and say: NOT HERE! NOT NOW! NOT THEN! NO HOW! NO wAY! To destroy the very model of "Quality Environment," by permitting the flooding of a vibrant, healthy, green-and-growing community space now covered with giant trees, a space open/inviting to the entire Clear Lake City populace (and visitors, as well) --- to put an end to that priceless environmental resource, in order to accommodate high volumes of contaminated water (i.e., "treated waste water") which will require, first, the destruction of our fifty-year-old central green belt and way of life, is absolute madness. Please do not give your stamp of approval to such obscene devastation of a place that gives our homes and citizenry---our community---a center of tranquil beauty. Turning that space into a giant sewer would be a civic travesty of inestimable harm and irresponsibility, an inexcusable exercise in egregious official vandalism, approved by highest authority. Please, please, please, in the name of all that endows an environment with "quality," in the name of common sense and holy stewardship, say "NO!" to CLCWA and their increased effluent permit. Preserve and defend the "Quality Environment" we in Clear Lake City have enjoyed for more than a half century. Don't allow Clear Lake City Water Authority to flush it all away!

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, May 27, 2014 9:57 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: patriciakaypowell@comcast.net [mailto:patriciakaypowell@comcast.net]
Sent: Monday, May 26, 2014 11:09 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Patricia Kay Powell

E-MAIL: patriciakaypowell@comcast.net

COMPANY:

ADDRESS: 1811 RESEDA DR
HOUSTON TX 77062-6018

PHONE: 2814885017

FAX:

COMMENTS: In urging the TCEQ to reject this Clear Lake City Water Authority permit request, I cite your instructions to parties who wished to have your body conduct a "Contested Case Hearing." You required: (1) "The location and distance of your property/activities relative to the facility" and (2) "A specific description of how you would be adversely affected by the facility in a way not common to the general public," the very issues leading to my plea---NIOBY! NIOBY! NIOBY! Resistance to unwanted uses of land often results in protests

MW

now so common that familiar acr as capture complaints typically sum zed as "Not In My Back Yard" (NIMBY) for projects deemed inappropriate or harmful in a setting near one's residence, workplace, or in the general vicinity of an area one calls "home." There is also "Not in Anyone's Back Yard" (NIABY) which is applied to land usage complainants consider so hazardous and harmful that it really should not be sanctioned in any place. In both of these examples, protests are generally about land usage in someone's metaphorical or figurative "back yard." By way of contrast, this protest to TCEQ, regarding CLCWA land use, is PLEASE, NO! NOT IN OUR [actual, literal] BACK YARD(S) When the original planners of this unique community began their creative venture, more than a half century ago, they had the luxury of incorporating all sorts of clever ideas on the drafting paper before them---maybe wild, untended, manmade wetland marshes and bogs; maybe high volume sewer and waterworks; maybe..., maybe... who knows what else---because they were working not only with entirely blank pages, but also with completely bare, undeveloped land (and plenty of it!) The new crop of Clear Lake City planners at the Water Authority deserve credit for all their forward-looking ideas, but they have chosen to turn blind eyes and ears to one enormously significant difference between the 2014 planning environment and that of their visionary predecessors: a highly inconvenient truth. In fact, they have decided to deny the presence and interests of approximately 400-or-so inconvenient truths. All alterations now contemplated by CLCWA in its extreme makeover plans for Clear Lake City's original green belt/golf course, will be made at the very center, right in the heart-and-core, of a fully developed, vibrant, mature residential community. For all who own homes adjacent to that green belt, these changes will seriously, negatively impact our extended, shared back yard, an inviting, open-to-all space that often flows without any visual or physical obstruction, from one individual's back door, across unbroken green, to the back doors of our neighbors. It was no coincidence that this very Texan of a municipal up-and-comer was promoted, early-on, as "America's Home Town." It invited Americans from across our nation to congregate here and join in a world-changing, futuristic adventure into space, while, at the same time, enjoying an old-as-the-hills, easy-going, neighborly, small town Texas way of life. That was our origin; it is our heritage; it should be the legacy we leave to those yet unborn. We who made the most significant single purchase of our lives on property immediately surrounding the original Clear Lake City Golf Course accepted a trade-off, receiving a benefit not available to other CLC homeowners, at a cost other residents are not required to pay. In exchange for the pleasure of having our personal property extend beyond official borders, to seamlessly join the big, beautiful, communal yard out back, we forfeited the right to provide extra privacy and protection for our homes, families, pets, and possessions, in the way other homeowners secure theirs (i.e., with strong, tall, back walls or fences) Instead, we were---and are---allowed only the questionable benefit of a barrier barely tall enough to keep a toddler in or an alligator (but certainly not a coyote) out, unless we sacrifice a sizeable chunk of property in compliance with fence set-back provisions. While public officials feel free to make drastic changes in the form and function of territory under their jurisdiction, with no regard for the destructive impact those alterations of public land will have on adjacent private land, we adjacent landowners remain bound by restrictions we assumed upon purchase of our homes. We purchased these homes intending to live up to our commitments, and in the reasonable, good faith expectation that the green belt to which our properties are inextricably linked would be maintained and administered with reciprocal, reliably responsible and environmentally sensitive stewardship. We homeowners continue to keep the faith and our commitments; we have followed the rules and observed the restrictions by which we and our properties are bound. We should be able to count upon public officials to carry out their obligations with integrity and a genuine appreciation for what Clear Lake City is and how it came to be. Our community has a proud and unique history. The citizenry should be able to trust our leaders to faithfully preserve our past, and its promises, with as much energy and determination as they devote to charting its bright future. No drastic re-planning, repurposing, or reshaping of our green common should be permitted, so long as those of us with adjacent properties remain tied to the legally binding responsibilities and restrictions that the purchase of our homes entailed. Like other major CLCWA proposed green belt projects, this greatly expanded wastewater accommodation plan represents an egregious breach of public trust, regardless of its legality, and an equally objectionable violation of basic common-sense residential land usage. I respectfully and urgently implore you to JUST SAY "NO!" to the introduction of increased wastewater capacity and volume into the back yard(s) of homes bordering the old golf course, in the interest of protecting homeowners' health and safety, while also protecting the financial value of our property.

May 29, 2014

Dear TCEQ,

I oppose the plan that will force millions of gallons of concentrated effluent water onto the old golf course of Clear Lake City. This area runs directly through my neighborhood. This concentrated effluent water will be within close proximity to single family houses and the town homes located off of Ramada. TCEQ states that they will protect public health. Does TCEQ realize that the Clear Lake City water Authority plans to make the old golf course green space a city wide recreational area. Within this recreational area the Clear Lake City Water Authority is proposing kayaking on the concentrated effluent water. Can TCEQ guarantee that the water is safe for families and their pets to wade into, in order to board their kayaks? Does the TCEQ realize that once the Clear Lake Water Authority enlarges and deepens the current ditches that the bottom of those ditches will be a clay basin? Does the TCEQ realize that the current ditches flow near Clear Lake High School, Clear Lake Intermediate School and across the street from Clear Lake City Elementary school? The use of concentrated effluent water in our ditches can jeopardize the health of our community. Does the TCEQ realize that there is an underground high pressure gas line where the Clear Lake City Water Authority wants enlarge the current ditch. Who is responsible for the charges associated with moving the gas line TCEQ or the Tax payers?

We oppose the use of concentrated effluent water throughout our neighborhood. This would jeopardize the health of the citizens that live within this neighborhood and would also jeopardize the health of the families that would visit the area for recreational purposes.

Thank you for consideration,

Chris Roberts
Felicia Roberts

Chris and Felicia Roberts

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MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, May 28, 2014 10:42 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 07424

From: bill.rodney@tpwd.texas.gov [mailto:bill.rodney@tpwd.texas.gov]
Sent: Wednesday, May 28, 2014 9:02 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR William Stanley Rodney, JR

E-MAIL: bill.rodney@tpwd.texas.gov

COMPANY:

ADDRESS: 15523 TORRY PINES RD
HOUSTON TX 77062-3419

PHONE: 2815340127

FAX:

COMMENTS: I have a MS in Ecology and have worked in many different aspects of aquatic ecology and habitat restoration. I strongly support this permit to the CLCWA to route a portion of reuse water to the former Clear Lake golf course, now called Exploration Green Park, to keep proposed wetlands healthy during dry spells and maintain flowing water. I believe this project will be a huge benefit to the ecological health and functioning of the Galveston Bay watershed. It will also improve the quality of life for residents living in the

MWD

vicinity of the park. I have noticed t the small but outspoken opposition ne park is driven by a handful of folks whose homes are directly adjacent to the two or three ponds on the old golf course. These folks would deny the entire community a wonderful park just to maintain their little Shangrila. The irony is, these ponds are maintained by reuse water and yet these people have been spreading lies about how the reuse water is raw sewage that will stink up the entire neighborhood. Don't be fooled by thier fear mongering propaganda, grant the permit and let the project proceed. THank you!

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

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MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Brian Schrock

Mailing Address: 1302 El Dorado ~~Houston, TX 77062~~

Physical Address (if different): _____

City/State: Houston, TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: bschrock2@gmail.com ✓

Phone Number: 832-217-7301

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

☑ **Please add me to the mailing list.** ✓

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

m2

I'm a lifelong resident of the Carr Lake Area. I'm a cyclist and an outdoorsman who walks or bikes Exploration green almost everyday. Im excited for the new trees, the new trails, and the natural state we will be able to enjoy when the project finishes.

[redacted]

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MAY 29 2014
AT PUBLIC MEETING

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, May 29, 2014 8:09 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: karen@karensherrill-homes.com [mailto:karen@karensherrill-homes.com]
Sent: Wednesday, May 28, 2014 11:30 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Karen Sherrill

E-MAIL: karen@karensherrill-homes.com

COMPANY: Simien Properties

ADDRESS: 1035 CLEAR LAKE CITY BLVD
HOUSTON TX 77062-8101

PHONE: 7138175710

FAX:

COMMENTS: As a local Realtor in Clear Lake I am in support of Exploration Green. I recently sold a home above list price that was on part of the proposed project. As part of my marketing, I used plans for the proposed Exploration Green improvements to show what a great home it was. One of the reasons it elicited multiple offers, I believe, is because it was along green space with the potential for me. I feel, professionally, that an improvement to the property with water features, walking/biking trails etc adds to property values - and is a

MWD

needed addition to Clear Lake. A ant unused lot does not add value. I : previously lived in a community with a recreational lake created completely with reclaimed water. This was not only an area used by families in the community, but also was a vivid example of how to live more green reusing our resources.

TCEQ Public Meeting Form
May 29, 2014

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AT PUBLIC MEETING

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: Roni Skirvin

Mailing Address: 15910 Parksley Dr. Hou Tx 77059

Physical Address (if different): _____

City/State: _____ **Zip:** _____

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: roniann@gmail.com ✓

Phone Number: _____

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

CLCWA BOARD OF DIRECTORS ELECTION

ELECTION HELD 05/10/2014

Roni Skirvin
Clear Lake Area Resident 22 years
Clear Lake Resident 14 years

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AT PUBLIC MEETING

CLCWA BOARD ELECTION OVERVIEW

- **CLCWA Board of Directors has five positions**
- **Directors are elected to 4-year terms, elections held every two years**
- **Two of five positions to be elected in 2014**
- **The top two vote-getting candidates were seated on the Board of Directors**

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CLCWA 2014 ELECTION OVERVIEW

- **Six candidates filed for office**
- **Two candidates (Thomas Morrow, Gordon Johnson) ran on CLCWA's records of service and low rates, and explicitly in favor of the Exploration Green project as adopted by the CLCWA Board of Directors**
- **Three candidates ran opposed to the plan in its current form (Steve Baxter, Tim Daggett, MG Spanial). One candidate (Joe Spence) dropped out of the race, but his name appeared on the ballot.**

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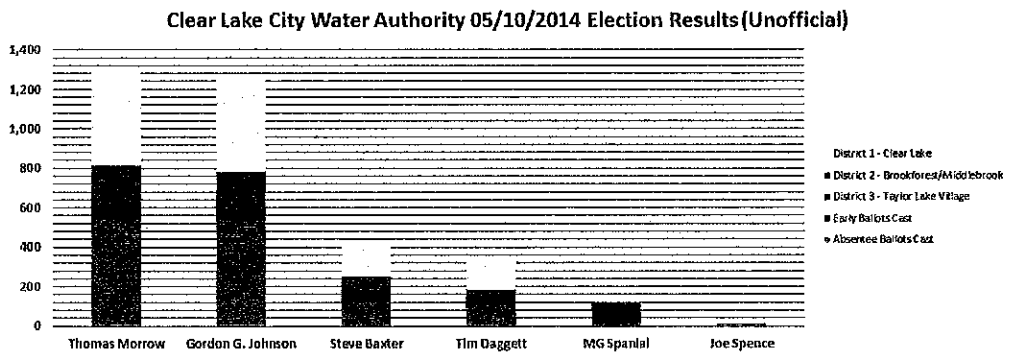
CLCWA 2014 ELECTION RESULTS



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CLCWA 2014 ELECTION HIGHLIGHTS

- **The candidates running in favor of the Exploration Green plan as adopted outpaced the candidates opposed by an approximate 3-to-1 margin**
- **The trend was consistent across early voting and the two districts most likely to be affected by the project. (Only Taylor Lake Village district trended differently, in favor of local resident MG Spanial.)**
- **The election results show broad-based community support for the Exploration Green project, of which the CLCWA permit amendment to support the wetlands is a part**

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AT PUBLIC MEETING

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TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: Adam Socki

Mailing Address: 750 Seafoam

Physical Address (if different): —

City/State: Hou **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: adam@socki.info ✓

Phone Number: (281) 773-9922

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? —

☒ **Please add me to the mailing list.** ✓

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mu

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 08, 2014 8:08 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 8/7/24

From: plsommer@netscape.net [mailto:plsommer@netscape.net]
Sent: Wednesday, October 08, 2014 7:31 AM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Paige Sommer

E-MAIL: plsommer@netscape.net

COMPANY:

ADDRESS: 1114 DUNHAVEN CT
HOUSTON TX 77062-2229

PHONE: 2814868174

FAX:

COMMENTS: As a Clear Lake homeowner in a subdivision near to the Exploration Green project I strongly support the Exploration Green project and the plans for the use of treated reuse water to provide a continual flow through the new water channel. Reuse water is used across the country in many places without odor issues or risks to public health. The CLCWA reuse water has been tested for bacteria content and was shown to have much lower levels than Horsepen Bayou and the other waters of the Armand Bayou watershed. I have a great

deal of personal experience with current treated reuse water usage on property in question and I have never found the water to have any odors or to appear in any way to be different from the water at my own house. The opponents of Exploration Green made the project the primary issue of the May 10th CLCWA board election, but the candidates supporting Exploration Green were elected by a 3-1 margin showing widespread public support of the current plan. I believe that this project will benefit both the environmental health and the quality of life for all of Clear Lake and particularly for the properties in close proximity to Exploration Green and I strongly support the approval of this permit application.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Wednesday, October 08, 2014 1:13 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

Incorrectly attached to the Enf Order. Please attach to the pending permit.

From: plsommer@netscape.net [mailto:plsommer@netscape.net]
Sent: Wednesday, October 08, 2014 7:31 AM
To: donotreply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Paige Sommer

E-MAIL: plsommer@netscape.net

COMPANY:

ADDRESS: 1114 DUNHAVEN CT
HOUSTON TX 77062-2229

PHONE: 2814868174

FAX:

COMMENTS: As a Clear Lake homeowner in a subdivision near to the Exploration Green project I strongly support the Exploration Green project and the plans for the use of treated reuse water to provide a continual flow through the new water channel. Reuse water is used across the country in many places without odor issues or risks to public health. The CLCWA reuse water has been tested for bacteria content and was shown to have much lower levels than Horsepen Bayou and the other waters of the Armand Bayou watershed. I have a great

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TCEQ Public Meeting Form
May 29, 2014

22

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: RICH SOMMER

Mailing Address: 1114 Dunhaven Ct.

Physical Address (if different):

City/State: Houston TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: rjsommer@earthlink.net ✓

Phone Number: 281-486-8174

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? Exploration Green

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MW

18

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT Stenerson

Name: Gary Stenerson

Mailing Address: 1707 Neptune Lane

Physical Address (if different): _____

City/State: Houston Texas **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: Stenerson@AOL.com ✓

Phone Number: 713 825-7694

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☒ **Please add me to the mailing list.** ✓

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mw

CLCWA Permit Number **WQ0010539001**
Texas Commission for Environmental Quality Public Meeting
Thursday, May 29, 2014 at 7:00 p.m.
Clear Lake Recreation Center Gym
16511 Diana Lane
Houston, Texas 77062

Gary K Stenerson, Clear Lake home owner
1707 Neptune Lane
Houston Texas, 77062

713 825-7694
Stenerson@AOL.com

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

I want to thank the TCEQ for this opportunity to provide input for the Clear Lake Water Authority permit request.

To provide context, I am a 34 year resident of Clear Lake. Our family has lived at our current location with the old golf course as our back yard neighbor for the last 32 years.

With my current understanding of the permit, and with your and other governing agencies providing proper oversight, I am comfortable with the Water Authority's plan for the reuse water. Given the drought across Texas and the nation, it makes good sense to find better ways of using water. Comparing the option of pumping this water into the bay or using it as proposed by the Water Authority, the latter appears to be a smarter option. I just wish I could tap into this supply to reduce the cost of watering my yard and gardens as my understanding is that this water was used for years by prior gold course owners to safely and successfully water the fairway and greens behind out house.

As you know, there has been a vigorous debate within the Clear Lake community regarding the CLCWA plans for the old golf course. In addition to what you hear tonight; please consider the results of the recent CLCWA election as an indication on what the community wants for the old golf course.

Although I support the Water Authority plans, I would like to see some changes to what is proposed. My experience with the Water Authority leads me to believe that they will work with the homeowners to address our concerns. For example, we had public safety issues regarding the poor condition of the bridges and other structures found on the property that the previous owner had ignored. Once the CLCWA assumed responsibility for the property, the bridges and deteriorated buildings were removed. Thus, I expect that in many cases that the plans will go on as proposed. But I am confident that the Water Authority will take the time, if I am willing to listen, to why the plans must go forward as proposed. If there is any feasible way to make a change to resolve an issue, I believe the Water Authority will adjust their plans as they did for planning for truck traffic and cleaning the streets during construction.

Finally, I encourage the Commission to approve the permit request. I would also ask that the Commission communicate the basis for the decision. Your basis will help educate everyone in the community on the risks you see in using the water as proposed by the Water Authority. I look at the Commission as neutral in how the land is used, but with the responsibility for ensuring the safety of our community with regard to the use and re-use of our water.

Thank you for your time,

Gary and Stacey Stenerson

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, April 06, 2015 4:21 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001
Attachments: CLCWA letter of support1.pdf

MWD 07424

From: msinger@galvbay.org [mailto:msinger@galvbay.org]
Sent: Monday, April 06, 2015 4:19 PM
To: DoNot Reply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Matthew Singer (Bob Stokes)

E-MAIL: msinger@galvbay.org

COMPANY: Galveston Bay Foundation

ADDRESS: 17330 HIGHWAY 3
WEBSTER TX 77598-4133

PHONE: 2813323381

FAX:

COMMENTS: Dear Chief Clerk Bohac: I am writing to convey the support of the Galveston Bay Foundation (GBF) for Clear Lake City Water Authority TPDES Permit # WQ 001010539001. GBF has signed a conservation easement with Clear Lake City Water Authority (CLCWA) to protect the property as a multi-use green space in perpetuity. GBF is a proud partner in this project with the CLCWA, Trees for Houston , and the

Texas A&M Texas Coastal Watershed Program. Completion of the constant level detention ponds that will utilize reuse water will provide many positive environmental benefits for the area. These constant level ponds incorporate engineered wetland areas intended to filter water entering the property from surrounding neighborhoods. This increased filtration will improve the quality of storm water runoff flowing into Galveston Bay. Constant water levels will also help improve existing wildlife habitat and create new habitat for migratory and resident birds. Additionally, extensive restoration efforts are underway to recreate natural plant communities throughout the property. The use of reuse water as irrigation will be critical to the success of native trees, grasses, and wildflowers planted. Reuse water is widely utilized in most new subdivisions in our area to provide the constant water level in detention ponds. We encourage the TCEQ to approve this permit application. Thank you for your time and consideration. Sincerely, Bob Stokes President, Galveston Bay Foundation

GALVESTON BAY FOUNDATION

April 6, 2015

Ms. Bridget C. Bohac, Chief Clerk
TCEQ, MC-105
P.O. Box 13087
Austin, Texas 78711-3087

RE: Clear Lake City Water Authority TPDES Permit # WQ 001010539001

Dear Chief Clerk Bohac:

I am writing to convey the support of the Galveston Bay Foundation (GBF) for Clear Lake City Water Authority TPDES Permit # WQ 001010539001. GBF has signed a conservation easement with Clear Lake City Water Authority (CLCWA) to protect the property as a multi-use green space in perpetuity. GBF is a proud partner in this project with the CLCWA, Trees for Houston, and the Texas A&M Texas Coastal Watershed Program.

Completion of the constant level detention ponds that will utilize reuse water will provide many positive environmental benefits for the area. These constant level ponds incorporate engineered wetland areas intended to filter water entering the property from surrounding neighborhoods. This increased filtration will improve the quality of storm water runoff flowing into Galveston Bay. Constant water levels will also help improve existing wildlife habitat and create new habitat for migratory and resident birds.

Additionally, extensive restoration efforts are underway to recreate natural plant communities throughout the property. The use of reuse water as irrigation will be critical to the success of native trees, grasses, and wildflowers planted.

Reuse water is widely utilized in most new subdivisions in our area to provide the constant water level in detention ponds. We encourage the TCEQ to approve this permit application. Thank you for your time and consideration.

Sincerely,

Bob Stokes
President, Galveston Bay Foundation

• 17330 Highway 3, Webster, TX 77598 • Phone 281-332-3381 • Fax 281-332-3153 • www.galvbay.org • gbf@galvbay.org

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, June 24, 2014 7:46 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 20745

From: art@vex.net [mailto:art@vex.net]
Sent: Monday, June 23, 2014 10:05 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: DR. Art Stretton

E-MAIL: art@vex.net

COMPANY:

ADDRESS: 270 EL DORADO BLVD 908
WEBSTER TX 77598-2287

PHONE: 2813815678

FAX:

COMMENTS: I had the privilege to take middle school students on a tour of the Clear Lake City Water Authority treatment plant back in 2003. The employee guide told us the output treated water of the CLCWA plant was cleaner than the input lake water that the City of Houston uses to source its drinking water. If the words "lake water" were used to replace the words "treated sewage water" in the numerous comments questioning the health aspects of the Exploration Green Plan, and if it was considered that the existing ponds

that are so pleasant and healthful a lready filled with "stagnant treated s ge water", any health or smell concerns would been seen as without any rational basis. Surely the testimony of acknowledged experts in plant and animal ecology and water hydrology should carry more weight than those of us without the benefit of years of specialized exposure to all the issues associated with the Green Exploration Plan. Please consider ratifying the Green Exploration Plan TCEQ Permit WQ0010539001 without additional public meetings but please mail all 900 or so of the adjacent property owners with copies of all the plans, projections for performance for public enjoyment and ecological benefit, and health studies for Exploration Green. Those homeowners should be more concerned about increased noise from increased wildlife activity than the concerns they have to date filed with the TCEQ. Thank you for your time and service.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, July 01, 2014 8:24 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

From: swerdlin@swbell.net [mailto:swerdlin@swbell.net]
Sent: Monday, June 30, 2014 3:56 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: MR Fred Swerdlin

E-MAIL: swerdlin@swbell.net

COMPANY:

ADDRESS: 815 BRADWELL DR
HOUSTON TX 77062-3301

PHONE: 2814888193

FAX:

COMMENTS: I support the the efforts of the Clear Lake City Water Authority in pumping up to 10 Million Gallons of treated waste water into where the former Clear Lake City Golf Course use to be located. This water will allow positive water flow at the bottom of the channel to prevent / reduce mosquito's hatching in stagnate water. Additionally, having a first class recreational facility quite close to where I have lived since March 1982, would be a great boon to our property values in the general area. Base upon documentation provided by the

Water Authority, the discharged ' r bacteria levels are far far below wl vould be the maximum levels allowed. I attended the meeting in May, and the opponents are attempting to hold the Water Authority to an impossible standard, where other waters which flow into the area where pumping will occur, to have those waters, which come from outside the jurisdiction of the Water Authority, to hold those waters to the same levels of bacteria standards. One comment at the meeting, wanted the Water Authority to ensure the ground water held to the same standard as the treated waste water, not knowing where that water originated. I hope you approve the permit, so we will have a first class recreational facility with flowing water, preventing / reducing mosquito larvae from hatching.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 02, 2014 9:07 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 97424

From: dadswingle@netscape.net [mailto:dadswingle@netscape.net]
Sent: Thursday, May 29, 2014 6:10 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: William Lloyd Swingle

E-MAIL: dadswingle@netscape.net

COMPANY:

ADDRESS: 16007 DIANA LN
HOUSTON TX 77062-4406

PHONE: 2814882421

FAX:

COMMENTS: This permit is to allow necessary quantities of reuse water on a public project to convert an abandoned old golf course acreage to a dentention or retention pond project. This purpose of this project, called Exploration Green, is to provide enhanced flood control capability in the Clear Lake area. Opponents to this permit amendment claim that the use of reuse water will pose a health hazard to people living near the project or visiting the preject. I have lived immediately adjacent to the project since 1969. For about the next 20 years or

so, while the golf course was stil. ,ve, reuse water was extensively use\ water the course and to maintain retention pond water levels in several ponds about the course. This repetitive exposure to this water never caused any health issue to my family nor have I ever heard of any health issues over the 45 years that I have lived here. I urgently request that you favorably consider this permit ammendment. I understand that the permit is of vital importance to the Exploration Green Project,which is why, without valid cause, opponents of the project are fervently opposing this permit amendment. Please approve the subject permit amendment.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, June 02, 2014 9:07 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 87424

From: dadswingle@netscape.net [mailto:dadswingle@netscape.net]
Sent: Thursday, May 29, 2014 6:08 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: William Lloyd Swingle

E-MAIL: dadswingle@netscape.net

COMPANY:

ADDRESS: 16007 DIANA LN
HOUSTON TX 77062-4406

PHONE: 2814882421

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MW

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May 29, 2014

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AT PUBLIC MEETING

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

PLEASE PRINT

Name: Bill Thompson

Mailing Address: 1918 Fairwind Houston, Tx 77062

Physical Address (if different): Same

City/State: Houston Tx **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: BT263@comcast.net ✓

Phone Number: 281 286 7141

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.** ✓

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

mw

Permit #10539001

To: Members of the TCEQ Board

As one of the four hundred golf course residents being affected by the retention plan (permit number WQ0015390001 B.T.) I am hoping it will not pass.

Allowing the pumping of treated sewage water, at a rate of 1,080,000 gallons a day, plus excess runoff from other geographic areas can only be harmful to all of the men, women and children who live in this area. The influx of vermin (rats, mosquitoes, alligators, coyotes, skunks, etc.), bugs, and harmful bacteria that could carry antibiotic-resistant superbugs would bring a health hazard to my neighbors and myself. As a senior citizen I worry about this.

In conclusion, I cannot see how cutting down over three thousand oxygen producing trees can be ecologically feasible for my neighborhood.

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MAY 29 2014
AT PUBLIC MEETING

Bill Thompson
1918 Fairwind, Houston Tx 77062
281 286 7141

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Tuesday, July 01, 2014 8:24 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001

MWD 97424

From: cmtorrestx@mac.com [mailto:cmtorrestx@mac.com]
Sent: Monday, June 30, 2014 3:59 PM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER:

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Candy Torres

E-MAIL: cmtorrestx@mac.com

COMPANY:

ADDRESS: 1239 BAY AREA BLVD #1111
HOUSTON TX 77058-2543

PHONE: 8327263555

FAX:

COMMENTS: I support the development of Exploration Green according to the Clear Lake Water Authority design. I want the entire former golf course to be a green zone for hiking, biking, recreation, nature preserve, and flood retention. There should be no residential or commercial development on the site.

(8)

TCEQ Public Meeting Form
May 29, 2014

Clear Lake City Water Authority
Water Quality TPDES
Permit No. WQ0010539001

RECEIVED
MAY 29 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: FRANK WEARY

Mailing Address: 14823 TUMBLING FALLS CT
HOUSTON TX 77062

Physical Address (if different): _____

City/State: HOUSTON TX **Zip:** 77062

****This information is *subject to public disclosure under the Texas Public Information Act*****

Email: FRANK.@WEARY.NET ✓

Phone Number: 713 806-8140

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☐ ✓ **Please add me to the mailing list.** ✓

☐ ✓ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** ✓

☐ ✓ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.** ✓

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

MW

Frank G. Weary
14823 Tumbling Falls Ct, Houston TX 7[illegible]2
713 806-8140 frank@weary.net Permit Amendment **WQ0010539001**

OUTLINE OF MAJOR POINTS

- There is a real and increasing flood potential, especially in northern Clear Lake
- Existing "100 year" and "500 year" flood estimates understate the probability of flooding
- Extensive street flooding reduction could also benefit from the plan
- Rapid implementation of the plan is needed to reduce the flood risk
- Presence of the wetlands fringe in the plan will dramatically reduce pollution from rain events
- Using reuse water to maintain lake levels during dry periods is needed to assure survival of the wetlands, assure a healthy ecosystem for fish, reduce mosquito problems, and improve the aesthetics of the project
- Quality of reuse water is safe, generally meeting Type I TCEQ standards even though the Permit allows Type II discharge
- The existing bacteria counts in reuse water are 30-60 times lower than existing streams and tributaries
- There are no meaningful health risks from using CLCWA reuse water
- The project is expected to have a positive impact on surrounding home values and serve as an exemplary recreational space for area residents

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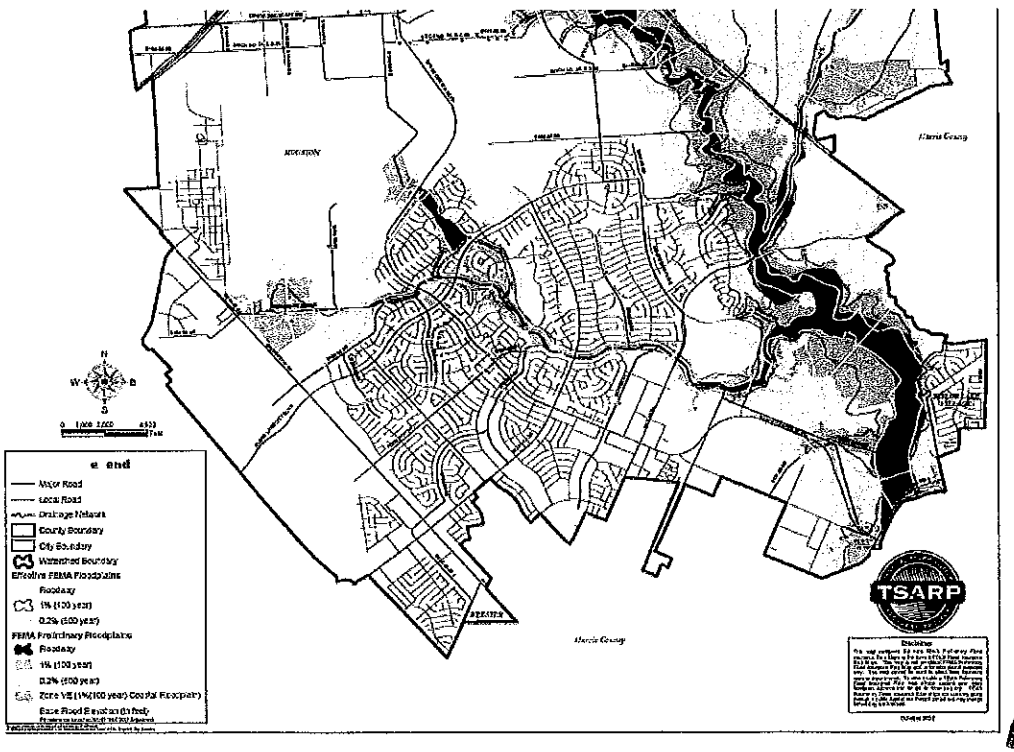
AT PUBLIC MEETING

Frank G. Weary
14823 Tumbling Falls Ct, Houston TX 77062
713 806-8140 frank@weary.net Permit Amendment **WQ0010539001**

My name is Frank Weary. I am Chairman of the Exploration Green Conservancy. That group is charged with raising fund for the installation and operation of recreational facilities on the property in question that we have called Exploration Green. I support moving forward with the project in general and with the Permit Amendment (**WQ0010539001**) as quickly as possible to achieve environmental improvements and reduce the risk of flooding.

I have been involved with community organizations for nearly 25 years in the Clear Lake area. During this time I have noticed increased water levels in Horsepen Bayou from all rain events. Concerns about potential flooding led other community leaders and me to request that Clear Lake City Water Authority (CLCWA) look at the situation. Their own concerns had led CLCWA to commission two hydrological studies that concluded CLCWA should double the water detention standard, acquire the land in question and retrofit the land for storm water detention. Events like tropical storm Allison have resulted in additional flood risk studies that reinforce the conclusion that action was required. The attached TSARP map shows that the "500 year" flood risk area extends from east of El Dorado Boulevard to Ellington Field north of Clear Lake City Boulevard, and from the north fork of Horsepen Bayou nearly to Highway 3 as far south as the northern boundary of Exploration Green. The preliminary FEMA Flood Insurance Risk Map shows an essentially identical risk area.



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During Allison, I watched the street flooding expand to within 6 inches of entering my home. Since Allison there has been significant development near the headwater of Horsepen Bayou that has increased the storm load in the Bayou; Additional development in this area is currently underway. Also, in the past 25 years, we have experienced 3 separate "500 year" rain events plus 5 additional "100 year" rain events. Clearly the risk of flooding is understated in the"500 year" flood plain, and this risk is

Frank G. Weary
14823 Tumbling Falls Ct, Houston TX 7. .52
713 806-8140 frank@weary.net

increasing. Clear Lake is also prone to extensive street flooding from even more minor rain events. The attached picture is from The Bay Area Citizen of November 7, 2013. It shows street flooding at Space Center Boulevard and Bay Area Boulevard that occurred after a 4.36" rain on October 31.

Attached are additional pictures from a 6 inch rainfall a few years earlier.

Space Center at Bay Area Boulevard (two different exposures)

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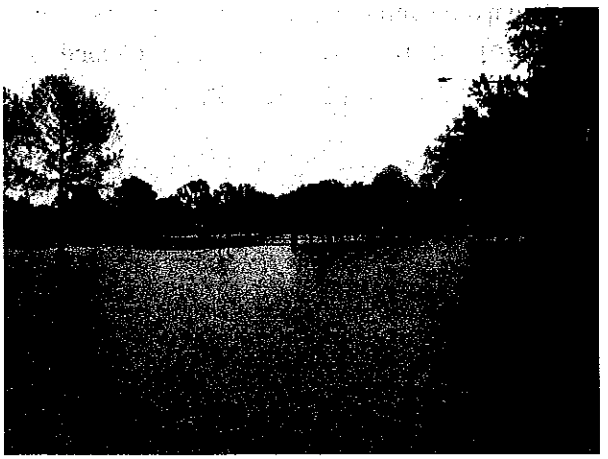
AT PUBLIC MEETING

Frank G. Weary
14823 Tumbling Falls Ct, Houston TX 77062
713 806-8140 frank@weary.net Permit Amendment **WQ0010539001**



Reseda Dr at CLC Elementary School

Home flooding at Reseda Dr and Tory Pines Rd

Not all the street flooding is due to an overflow from Horsepen Bayou, but overloading of the drainage system should be reduced by the Exploration Green storm water detention area.

Of course we could implement a "dry bottom" detention area and eliminate the need for reuse water except for irrigation like was previously done on the land. Present thinking for most detention areas would have wet bottom lakes incorporated for aesthetic reasons. Additionally, the proposed lakes include 5 half-acre wildlife preserves that would be lost if there were no lakes. Perhaps most important however is that the lakes allow the introduction of fringe wetlands that will "polish" the storm runoff from every rain, capturing the higher pollution surge associated with the first 20 minutes to 2 hours of a rainfall. This will dramatically improve the quality of the discharge from the 2000 acre collection zone into Horsepen Bayou. For several months each year it will be necessary to supplement natural water flows with additional supplies; environmentally the best source of that water is reuse water from CLCWA. Without the water, the lakes would dry up, the lake fish and the wetlands will die and the number of mosquitoes would be higher since there would be little or no water movement.

Available data based on reporting to TCEQ and additional TCEQ studies indicate that the water is safe for discharge in this area and that the bacteria counts for the water are 30 – 60 times lower that the existing water in Horsepen Bayou and the tributary that flows through the land. The water has no color or odor, is suitable for release and for consumption by fish, birds and other wildlife. As a final precautionary step, we plan to post and enforce a "No swimming or boating" policy unless or until the permit is further amended to allow only Type 1 discharge. To my understanding, there are no plans to request such an additional amendment even though the quality of the current discharge generally meets Type 1 standards.

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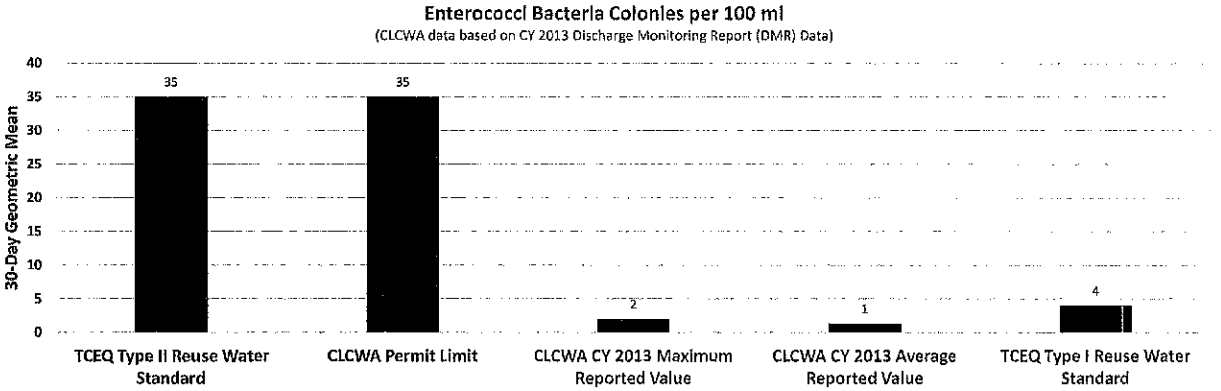
AT PUBLIC MEETING

I believe that the implementation of the proposed Master Plan will produce a scenic attraction as an urban green recreation area in Clear Lake, and the aesthetics of the resulting implementation will dramatically increase home values of adjacent property with no risk to the health of the residents. I envision a sparkling green oasis that will positively distinguish Clear Lake area for years to come and be enjoyed by people from the entire area while dramatically mitigating flood risk potentials.

Frank G. Weary
14823 Tumbling Falls Ct, Houston TX [illegible]02
713 806-8140 frank@weary.net Permit Amendment **WQ0010539001**

CLCWA ENTEROCOCCI LEVELS (30-DAY GEOMETRIC MEAN)



AMBIENT/RECEIVING WATER BACTERIA

TCEQ TECHNICAL SUPPORT DOCUMENT: BACTERIA TOTAL MAXIMUM DAILY LOADS FOR THE ARMAND BAYOU WATERSHED, HOUSTON, TEXAS, CONTRACT NO. 582-10-90494
COMPILED FROM TABLE 1-10: HISTORICAL WATER QUALITY DATA FOR TCEQ STATIONS FROM 2000 TO 2012, AND TABLE 2-3 WATER QUALITY MONITORING STATIONS USED FOR 303(D) LISTING DECISION

Segment Name	Assessment Unit	Station ID	Station Description	Indicator Bacteria	Geometric Mean Concentration (MPN/100 ml)	Number of Samples
Armand Bayou Tidal	1113_02	11503	Armand Bayou Tidal at Bay Area Blvd north of NASA at middle of median between 2 bridges eastern shore	**EC**	**271.4**	35
				ENT	**42.8**	110
Armand Bayou Above Tidal	1113A_01	11404	Armand Bayou at Genoa-Red Bluff Rd NE of Ellington AFB	EC	204.6	111
		11405	Armand Bayou at Fairmont Parkway along median at midpoint between bridges	EC	56.3	5
		17488	Armand Bayou Above Tidal 77 meters upstream of Dedman Street/West Pasadena Blvd in southeast Houston	EC	1,179.3	82
Horsepen Bayou	1113B_01	11409	Horsepen Bayou at Bay Area Blvd north of NASA	**EC**	**205.8**	37
				ENT	**58.4**	87
		17317	Horsepen Bayou at Middlebrook Dr. in southeast Houston	**ENT**	**64.7**	31
Unnamed Tributary to Horsepen Bayou	1113C_01	17485	Unnamed Tributary of Horsepen Bayou Tidal at Penn Hills	**EC**	**215.1**	108
Willow Springs Bayou	1113D_01	17487	Willow Spring at Bandridge Rd in southeast Houston	EC	744.0	109
Big Island Slough	1113E_01	17486	Big Island Slough at Hillridge Rd in southeast Houston	EC	608.7	105

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MAY 29 2014
AT PUBLIC MEETING

EXPLORATION Green!
Conservancy

MWD
87424

Mr. Richard A Hyde, P.E., Executive Director,
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, TX 78711-3087

RECEIVED
APR 09 2015

2015 APR -7 AM 10:17
CHIEF CLERKS OFFICE

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Re: Contested Case Hearing Request
Clear Lake City Water Authority
Customer Number: CN600270102
Regulated Entity Number: RN 101440485
TPDES Permit Number: WQ0010539001

Exploration Green Conservancy

Chairman
Frank Weary

Vice Chairman
Doug Peterson

Secretary
Paul Morris

Treasurer
Kathy Dooley

Executive Board

Allen Brown

Debra Goode

Anthea Guest

Claire Mules

Roni Skirvin

Charles Smitherman

Michelle Vrynn

Dear Mr. Hyde,

This is a request that the Permit Amendment referenced in the above be approved without additional delay. The request is made on behalf of the Exploration Green Conservancy (EGC); EGC is the non-profit entity that is securing funding for non-excavation improvements as well as implementing these improvements at the site. As part of the request for rapid approval we are imploring that you deny the contested case hearing requests. In short, no new applicable issues have been raised in these requests that were not previously considered and adequately addressed in the previous findings, and the issues raised have been fully demonstrated to be without merit. On the other hand, there are several considerations that favor the rapid approval and implementation of the terms of the Amendment.

An integral part of the Exploration Green project is the installation of wetlands fringes around the proposed lakes that are part of the storm water detention/retention system. The wetlands plants will help cleanse the initial storm water runoff that contains the highest portion of street oils and other stream pollutants, dramatically improving the quality of the outfall into Horsepen Bayou. The Permit Amendment provides the capability to maintain a minimum water level when rainfall and natural water flow would not be sufficient. Without this minimum water level the wetlands plants would dry out and die, taking with them the water quality improvements.

The Texas Coastal Watershed Program (associated with Texas A&M University) has secured a major grant to provide the wetlands plants. As part of the grant, a wetlands plant nursery has been constructed on the Exploration Green site. This effort was started several months ago in anticipation of the start of construction for the project. Exploration Green construction and transplanting of the wetlands plants is awaiting the Permit Amendment approval since the minimum water level is critical to the health of the plants. These plants have reached a point where transplanting to the permanent location will be needed soon. Significantly delaying the approval process further not only delays the water quality improvement, but risks loss of these plants and potentially loss of the grant opportunity and permanent loss of the water quality improvement opportunity.

In another environmental quality initiative associated with Exploration Green, we have established a partnership with Trees for Houston. They have provided 1,000 Texas native trees of varying sizes to be planted on the site after the excavation. These trees will not only provide an attractive green space, but will serve as a natural habitat for various wildlife and birds, both migratory and resident. We have implemented an on-site tree nursery to nurture these trees until they can be transplanted. Similar to the wetland plants, many have now matured to the point that they soon must be moved to a permanent location. Like the wetlands plants, further delay in the Permit Amendment approval risks loss of these trees and potentially loss of the Trees for Houston grant both for this 1,000 trees and for an additional 4,000 trees committed by Trees for Houston for future sections.

The Master Plan to develop Exploration Green includes re-use water for the proposed lakes in the project. This re-use water is a key element that has already won significant recognition for the Plan from non-affiliated groups such as the City of Houston Mayor's Proud Partners Recognition Award, the Houston-Galveston Area Council Parks and Natural Area Award, and most recently an award from the Texas Landscape Architect Association. These and other groups recognize the value in rapidly pursuing the plan with the Permit Amendment.

Hundreds of volunteers have given their time and monies to this effort. The volunteers continue to support the two nurseries as well as other improvement efforts at the site, but extended delays in starting construction will risk losing these volunteers and future funding. In the recent election for the Clear Lake City Water Authority Board positions, the election came down to two slates of candidates - one favoring the Master Plan development of the site, and the other slate opposing the Plan. The election resulted in those favoring the Plan being elected by a three to one margin. The informed citizens of Clear Lake understand and support the need for the project and for rapid approval of the Permit Amendment as an integral part of the Plan. We humbly request that you proceed with rapid approval of the Permit Amendment and deny the contested case hearing.

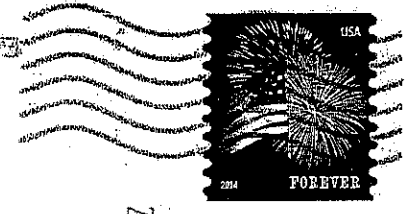
Sincerely yours,

Frank Weary
Exploration Green Conservancy Chairman

EXPLORATION Green!
Conservancy
2323 Clear Lake City Blvd, Ste 180, Box 265
Houston, TX 77062

NORTH HOUSTON TX 773

07 APR 2015 PM 2 L



TCEQ Chief Clerk, MC-105

P.O. Box 13087

Austin, TX 78711-3087

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
2015 APR -7 AM 10:57
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JH

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Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, April 02, 2015 12:49 PM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number WQ0010539001
Attachments: TCEQ Letter 3-31-15.pdf

MWD 87424

From: frank@weary.net [mailto:frank@weary.net]
Sent: Thursday, April 02, 2015 9:30 AM
To: DoNot Reply
Subject: Public comment on Permit Number WQ0010539001

REGULATED ENTY NAME ROBERT T SAVELY WATER RECLAMATION FACILITY

RN NUMBER: RN101440485

PERMIT NUMBER: WQ0010539001

DOCKET NUMBER: 2014-1035-MWD-E

COUNTY: HARRIS

PRINCIPAL NAME: CLEAR LAKE CITY WATER AUTHORITY

CN NUMBER: CN600270102

FROM

NAME: Frank G Weary

E-MAIL: frank@weary.net

COMPANY: Exploration Green Conservancy

ADDRESS: 2323 CLEAR LAKE CITY BLVD Ste 180 Box 265
HOUSTON TX 77062-8120

PHONE: 7138068140

FAX:

COMMENTS: Please see attached request to deny a contested case hearing. Land mail copy to follow.

mw

EXPLORATION Green!
Conservancy

Mr. Richard A Hyde, P.E., Executive Director,
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, TX 78711-3087

Re: Contested Case Hearing Request
Clear Lake City Water Authority
Customer Number: CN600270102
Regulated Entity Number: RN 101440485
TPDES Permit Number: WQ0010539001

Exploration Green Conservancy

Chairman
Frank Weary

Vice Chairman
Doug Peterson

Secretary
Paul Morris

Treasurer
Kathy Dooley

Executive Board

Allen Brown

Debra Goode

Anthea Guest

Claire Mules

Roni Skirvin

Charles Smitherman

Michelle Vrynn

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