

4. Restore and Repair Riparian Zones



Wetlands along Brays Bayou, Houston TX

Vegetated riparian zones are an important component of our bayous that provide functional and aesthetic values. *Vegetated shorelines minimize soil erosion and naturally increase filtration of surface water runoff.* In many areas of the watershed, Dickinson Bayou has little natural riparian buffer left. Much of the Bayou's shore line is mowed lawn and bulk headed which provides little water filtration.

There are programs available that assist landowners in evaluating their property and installing a natural alternative to a bulk heading, often called a "living shoreline." In addition the previously mentioned functions, these living shorelines also provide areas for fish to spawn and safe spots for young fish to hide and grow, often improving fisheries in the areas where they are installed.

5. Preserve and Restore Natural Wetlands



A prairie pothole wetland located in Matagorda County, TX

Wetlands are a key part of the Upper Texas Gulf Coast ecosystem and add to the subtle beauty of coastal prairies. They are also an integral part of the hydrologic system that naturally cleans and detains stormwater as it makes its way to Galveston Bay. For these reasons, conservation and restoration of wetlands is a necessary component of water quality management. Preservation of wetlands in their natural state is one of the best ways to allow for natural filtration of bacteria from our water.

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6. Construct Stormwater Treatment Wetlands

Constructed stormwater treatment wetlands clean water in the same ways as natural wetlands; wetland plants filter water as it passes through them and chemical and biological processes unique to wetlands render many pollutants harmless, making the water exiting the wetland much cleaner than when it entered. The watershed would benefit from stormwater treatment wetlands to improve and maintain the water quality in Dickinson Bayou.

7. Implement Stormwater Best Management Practices



A rain garden at the City of Dickinson Public Library

Low impact development (LID) best management practices (BMPs) are tools that mimic the natural hydrology of an area, allowing water to soak into the soil and as much as possible minimize runoff. Some examples of these BMP's are:

- Rain Gardens
- Bioswales
- Rain Water Harvesting

The design of BMPs is site-specific and most are intended to be small scale projects that can easily be incorporated into a new or existing yard, parking lot or landscape. Several local examples of BMPs exist including a rain garden at the City of Dickinson Public Library and a rain water harvesting system at San Leon Elementary School. More LID's are needed in the watershed to improve water quality of Dickinson Bayou.

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DICKINSON BAYOU WATERSHED PARTNERSHIP



Dickinson Bayou
WATERSHED PARTNERSHIP

An Overview of the Dickinson Bayou Watershed Bacteria Implementation Plan: Strategies for Success

The Dickinson Bayou watershed encompasses approximately 100 square miles of land that drains water into the bayou. Dickinson Bayou is classified as impaired for bacteria by the Texas Commission on Environmental Quality (TCEQ), which means higher than acceptable levels of bacteria have been consistently measured in the bayou.

What is a Bacteria Implementation Plan?

The ultimate goal of the I-Plan is the reduction of bacteria concentrations in Dickinson Bayou Tidal, Dickinson Bayou above Tidal, Bensons Bayou, Bordens Gully, and Giesler Bayou to levels that meet state water quality standards.

A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant.

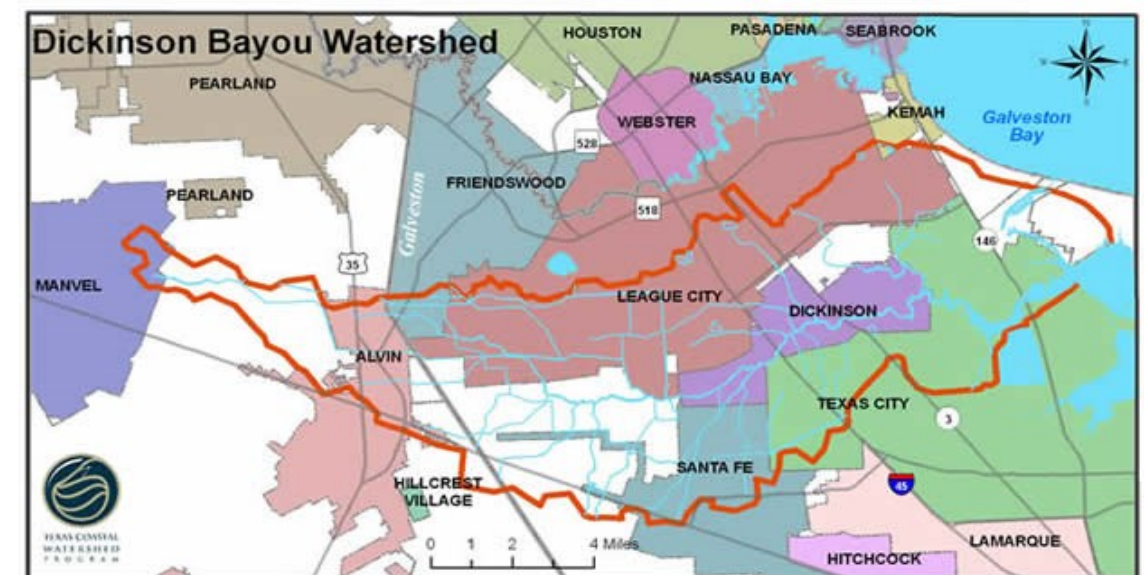
The TMDL report identified potential regulated and unregulated sources of bacteria. Regulated dischargers in the Dickinson Bayou watershed include domestic wastewater treatment facilities, sanitary sewer overflows, industrial facilities, a municipal solid waste

facility, and regulated storm water dischargers. Potential unregulated bacteria sources identified in the TMDL include malfunctioning on-site sewage facilities, livestock, wildlife, exotic animals and domestic pets.

The Implementation Plan or I-Plan is a stakeholder derived plan based on the TMDL document that :

- Describes the steps the TCEQ and its stakeholders will take to achieve the pollutant reductions identified in the TMDL report.
- Outlines the schedule for implementation activities.
- Identifies groups responsible for activities.

The rest of this document outlines the 7 key management measures in the I-plan. For full detail please refer to the I-plan found at **(INSERT FUTURE URL HERE)**



The Dickinson Bayou watershed, located between Houston & Galveston, TX, is 105 square miles. It contains pieces of nine cities (Alvin, Dickinson, Friendswood, Kemah, League City, Manvel, San Leon, Santa Fe and Texas City) and two counties (Galveston and Brazoria).



1. Manage On-Site Sewage Facilities

A substantial percentage of households in the Dickinson Bayou watershed are served by on-site sewage facilities (OSSF) or septic systems. The most recent estimates put the count at over 5,100. On-site sewage facilities treat wastewater by moving it through the soil, where it is cleaned through filtration and microbial processes. These systems can be quite effective in the right conditions.

However, *if the OSSF is not designed to match soil conditions, there is a very real risk of failure* and the consequent surfacing of untreated wastewater, which could easily find its way into Dickinson Bayou.

The I-plan recommends:

- Expanding homeowner OSSF education
- Connecting homes to wastewater treatment plants where appropriate
- Upgrading or fixing identified failing on-site sewage facilities
- Incorporating OSSF criteria into standards of practice for home sale inspections



A failing septic system can cost you thousands of dollars to repair and can be a serious health risk to your family and pets.

2. Address Wastewater Treatment Facilities & Collection Systems



A WWTF on Dickinson Bayou

There are multiple places where issues with wastewater treatment facilities (WWTF's) and their collection systems could result in unintended releases of untreated or partially treated effluent that could reach Dickinson Bayou and its tributaries, contributing bacteria to the stream. Collection pipes can break as they age or as the ground shrinks or swells, lift stations can malfunction, treatment facilities can experience overflows, and sludge and sewage debris can leak. None of these problems are allowable under TCEQ issued permits and the WWTFs are required to report and fix these issues.

A properly functioning wastewater treatment facility should not be contributing bacteria to the receiving water body, including Dickinson Bayou. There are 11 permitted wastewater treatment facilities that discharge into Dickinson Bayou and its tributaries. Eight of the 11 WWTFs in the watershed treat domestic wastewater and therefore have the potential to contribute to the bacteria load.

Decreasing bacteria load will be accomplished in the following ways:

- Upgrade plants
Facilities that are failing or fail to meet requirements due to structural or design problems need to be upgraded and/or repaired to bring the facility into compliance.
- Address Fats, Roots, Oils, and Grease
FROG (Fats, Roots, Oil and Grease) is a common problem that results in sanitary sewage systems (SSS) failures. These items clog and break pipes causing overflows, malfunctions and failures. Community awareness is essential to prevent blockages from occurring.



Sewer pipeline clogged by oil & grease
<http://www.ceasethegrease.org/photos/>

WWTF's operate under state issued permits, therefore some actions can be enforced through permit changes. These are called "Control Actions" and include:

- Implement stricter bacteria limits and stricter enforcement measures for WWTF effluents
- Increase WWTF compliance and enforcement actions by TCEQ
- Restructure TCEQ penalties for SSS and WWTF violations
- Improve reporting requirements for WWTF's to TCEQ sanitary sewer overflows

3. Address Animal Waste

A variety of programs currently exist which provide land owners with the technical and/or financial assistance necessary to combine sustainable land stewardship activities with land production activities (e.g., livestock operations, wildlife habitat conservation operations, etc.). Landowner participation in these programs is likely to reduce the amount of bacteria entering waterways by addressing issues related to water quality, soil erosion and sedimentation, livestock waste management, and other issues.

Pet waste also contributes substantial amounts of bacteria to our bayous. Feces left in parks, yards or sidewalks gets washed off by rain water and carried into storm drains.



Bag it for the Bayou outreach campaign poster

These storm drains lead directly to Dickinson Bayou and its tributaries. Water carried through these drains deposits feces, bacteria and other harmful pollutants into our waterways including Dickinson Bayou.

It is possible to prevent these pollutants from entering nearby storm drains and waterways if actions are taken such as:

- Expanding pet waste education to pet owners
- Installing pet waste stations in parks and public areas
- Improving Homeowners Association bylaws and ordinances for pet waste control
- Developing and enforcing pet waste control ordinances

Promoting the reduction of feral hog populations through education for landowners and technical assistance. Will also aid in reducing animal waste that negatively impacts the Dickinson Bayou.



A family of feral hogs caught in a trap
<http://wild-wonderings.blogspot.com/>