Clean Waters Initiative
Efforts to Improve the Region’s Water Quality

August 26, 2021
Online Meeting Notes

- The meeting is being recorded
- Microphones will be muted, and cameras turned off
- Ask your questions using the chat function or
- Use the Reactions button to raise your hand to be asked to unmute
- Use *9 to raise your hand if you are calling in on your phone
Handheld Device Tools

- Access chat or raise your hand using the 3 dots at the bottom of the screen.
H-GAC’s Efforts to Improve the Region’s Water Quality

Watershed-based Plans Introduction
Todd Running, Program Manager

August 26, 2021
Coordinated Monitoring

- Clean Rivers Program Monitoring
- Over 400 Water Quality Monitoring Stations
- Eight Local Partners
Watershed Based Planning

- Watershed Protection Plans
- Total Maximum Daily Load Implementation Plans
Plan Implementation

On-Site Sewage Facilities

Pet Waste Stations

Targeted Monitoring

Public Education
Agenda

- 1:30 p.m. Watershed-based Plans Introduction..............................Todd Running
- 1:35 p.m. Septic System Outreach and Education............................Brian Sims
- 1:50 p.m. Septic System Repair and Replacement.............................Daniel Albanese
- 2:05 p.m. Non-point Source Education........................................Kendall Guidroz
- 2:20 p.m. Urban Forestry/Riparian Cover.....................................Justin Bower
- 2:35 p.m. Green Infrastructure..................................................Steven Johnston
- 2:50 p.m. Targeted Monitoring....................................................Jessica Casillas
- 3:05 p.m. Closing & Breakout Instructions...................................Todd Running
- 3:10 p.m. Watershed-specific Breakout Sessions............................All
H-GAC’s Efforts to Improve the Region’s Water Quality

On-Site Sewage Facility Outreach and Education

Brian Sims, Senior Planner

August 26, 2021
Introduction to On-Site Sewage Facilities

On-Site Sewage Facilities (OSSFs) treat up to 5,000 gallons/day of residential or commercial wastewater “on-site”

- Utilized in areas where connection to a residential sanitary sewer collection system is not available.

- Refers to both conventional septic systems and aerobic treatment unit.

- Provide effective and appropriate wastewater treatment if they are properly designed, installed, operated, and maintained.

Source: epa.gov
OSSFs and Wastewater Treatment

OSSFs treat sewage and remove contaminants before they reach groundwater or surface water.

- Organic materials
- Nutrients
  - Phosphorus
  - Nitrogen
- Pathogens
  - Bacteria
  - Viruses
  - Parasites
Failing OSSFs and Water Quality Impairments

When OSSFs fail, wastewater does not receive adequate treatment

- Source of bacteria, other pathogens, and nutrients
- Can contaminate groundwater and surface water

Factors in system failure:

- Lack of maintenance
- System age
- Inappropriate system design
- Inappropriate soil type
- Hydraulic overload
- Alteration of the drainfield

“Grandfathered” systems (installed before permit requirements were in place) are often not as efficient as new systems and are more prone to failure.
Failing OSSFs and Water Quality Impairments (cont.)

- Malfunctioning systems can contribute significant nutrient and bacteria loads to waterways, particularly those in close proximity (<500 ft)

- To evaluate OSSFs as a source of pollutants, it is necessary to know the distribution and failure rates of malfunctioning systems
  - In many cases, this has to be estimated
  - If local data is not available, literature values may be used
Failing OSSFs and Water Quality Impairments (cont.)

- **OSSF Failure Rates**
  - EPA cites 10 – 20% failure rate nationwide
  - Estimated at 12% in Texas
    - Varies by location, socioeconomic factors, etc.
    - Local knowledge (Authorized Agents, local stakeholders, etc.) is very important for accurately estimating failure rates
  - **EXAMPLE:** OSSF Failure Rate estimated at 50% for Westfield Estates Watershed Protection Plan due to
    - age of systems,
    - history of non-compliance with maintenance, and
    - local enforcement data from Authorized Agent
Failing OSSFs and Water Quality Impairments (cont.)

How much bacteria comes from a failing OSSF?

E. coli concentration of a failing OSSF = 1.0 x 10^7 cfu/100 mL
Sewage discharge rate = 70 gallons/person/day
Household Occupancy = 2.86 persons/household
Conversion Factor (CF) = 3785.4 mL/gallon

Potential Daily OSSF Load Per Day = \( \frac{1.0 \times 10^7 \text{ cfu } E. \text{ coli}}{100 \text{ mL}} \times \frac{70 \text{ gal}}{\text{person} \times \text{day}^{-1}} \times \frac{2.86 \text{ persons}}{\text{household}} \times \frac{3785.4 \text{ mL}}{\text{gal}} \)

= 7.58 \times 10^{10} \text{ cfu } E. \text{ coli} \text{ per household/day}

75,800,000,000 bacteria per household per day

To determine the total load for a watershed, you can multiply this value by the total number of households and the estimated failure rate.
OSSFs Locations in the Region

- H-GAC’s OSSF Mapping Tool
  - Online database and GIS mapping of OSSF permits in the 13-County Region
  - Compilation and analysis of OSSF permitting data submitted to H-GAC by Authorized Agents
    - 111,021 permitted OSSFs
    - 199,006 unpermitted OSSFs (estimated)
    - 310,027 total OSSFs (estimated)

http://datalab.h-gac.com/ossf/
H-GAC’s Online Information System

- Able to examine concentration of OSSFs (number of systems per square mile)
- Able to examine systems by age (based on permit date)
- Able to examine location of individual OSSFs based upon GPS coordinates
- Can measure proximity to water body
- Able to estimate the number and locations of unpermitted systems based upon parcel data for areas:
  - where there are no permitted systems
  - that are outside of a service area boundary for a permitted wastewater treatment facility
Reducing Pollution from OSSFs

- Options to reduce pollution from failing or malfunctioning OSSFs include:
  - Maintenance or repair
  - Installation of new OSSFs (when feasible)
  - Installation of low-flow devices to reduce influent volumes
  - Ongoing maintenance contracts
  - Abandonment and connection to residential sanitary sewer system
  - Homeowner education
H-GAC OSSF Educational Courses

- **Homeowner Education Course**
  - 2-hour course
  - Offered throughout the H-GAC region through watershed-based programs
  
  **Topics include:**
  - Basics of OSSF operations and maintenance
  - Guidance to assist homeowners with maintaining conventional and aerobic OSSFs
  - Course does **NOT** authorize a homeowner to maintain their owner system in lieu of a maintenance contract

---

**Basic OSSF Components**

- A typical OSSF will consist of four general components:
  1. **Wastewater Source** (sewer or septic tank)
  2. **Collection and Storage Tank** (septic or aerobic)
  3. **Disposal System** (dry well, leach field, spray field, etc.)
  4. **Soil** (where final treatment occurs)

---

**OSSF Maintenance: When is it time to pump?**

- Distance between **bottom** of scum and bottom of Outlet T should be at least 2”
- Distance between top of scum layer and top of Outlet T should be at least 2”
- Distance from top of sludge to bottom of Outlet T should be at least 12”

---

**OSSF Maintenance: Do’s and Don’ts**

- **Do not flush things that could kill the bacteria in the tank**
  - NEVER flush:
    - Gasoline or oil
    - Grease
    - Paint/paint thinners/varsnish
    - 1-2 gallons of liquid bleach/week
    - Antifreeze
    - Pharmaceuticals
    - Drain cleaners
    - Photograph solutions
    - Antibacterial soaps

- **Monitor Laundry Use**
  - Your system will not support several large loads of laundry in one day
    - Could stir up sludge layer
  - Space out smaller loads of laundry
  - Be mindful of water use, do not wash a small load on a large load setting
  - Use **COMMON SENSE**
H-GAC OSSF Educational Courses (cont.)

- **Real Estate Visual Inspection Training Course**
- 6-hour course
- Approved by the Texas Real Estate Commission for Continuing Education credits
- Offered throughout the H-GAC region
- Topics Include:
  - Basics of OSSF operations and maintenance
  - Different types of OSSFs
  - Rules and Regulations
  - Safety
  - Records and Documents
  - Visually inspecting conventional, low-pressure dosing, and aerobic treatment unit systems
- Includes a field portion to visually inspect an OSSF
Due to COVID-19 and social distancing requirements, no OSSF Educational Courses were offered during 2020 – 2021.

H-GAC plans to develop the **Homeowner Education Course** for a virtual environment so remote-learning options can be available.

Virtual learning opportunities will likely not be available in the immediate future for the **Real Estate Visual Inspection Training Course** since that course is specifically designed to include an in-person field component (the inspection of an actual functioning system).

• To be reevaluated as the COVID-19 threat level changes
Questions? Comments?

CONTACT INFORMATION

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Senior Planner
Houston-Galveston Area Council

Phone: (713)-993-2438
Email: brian.sims@h-gac.com
H-GAC’s Efforts to Improve the Region’s Water Quality

Septic System Repair and Replacement

Daniel Albanese, Planner

August 26, 2021
Project Description

Provides assistance to low-income homeowners to repair or replace malfunctioning or failing on-site sewage facilities (OSSFs)

Failing conventional system

New aerobic OSSF
Applicant Qualifications

- In order to qualify, applicants must:
  - own and reside in the home
  - reside in one of the eligible counties
  - have a combined household income at or below 80% of the median income for the county
  - have a failed or malfunctioning OSSF

Pipe discharging to field

Installation of new spray field
Source of Funding

- Funding for this project is being provided by both TCEQ and the Harris County District Attorney’s Office
SEP History

- $339,926.00 in funding utilized to date
- 39 applicants have qualified and are on the waiting list
- 14 OSSF repairs
- 24 replacement Aerobic OSSFs installed
- 2 replacements upcoming
- Pump-outs for seven homeowners in Bailey’s Prairie (Brazoria County)
Failing OSSFs
Recent Project Success

- Installation of new aerobic OSSF in Bay City (Matagorda County) – October 2020
  - Funded by T.C.E.Q

- Installation of new aerobic OSSF in Industry (Austin County) – January 2021
  - Funded by T.C.E.Q
Next Steps

- Continue marketing SEP program to potential contributors

- Continue seeking qualified applicants
  - Local Authorized Agents and Designated Representatives
  - Referrals from local governmental officials and agencies
  - Public Outreach events
  - Word-of-mouth from previous program recipients

- Continue identifying qualified vendors
Quotes from Project Recipients

“I really appreciate your help and assistance in helping my mother out. Thank you so much! And glad to know that there are people and organizations that help their citizens and people in these situations. Just to let you know people do appreciate your consideration and help! You don’t know how much…. I just want you to know you make a huge difference in people’s lives.”

- Resident, Baytown
For More Information

For more information regarding H-GAC’s SEP for Homeowner Wastewater Assistance, please contact:

Daniel Albanese
Program Support Specialist
Houston-Galveston Area Council
Daniel.Albanese@H-GAC.com
832-681-2692
H-GAC’s Efforts to Improve the Region’s Water Quality

Non-point Source Education: Coastal Communities Toolbox, Interactive Exhibits, and More

Kendall Guidroz, Planner

August 26, 2021

The Coastal Communities project is funded in part by the TCEQ through a grant from the United State Environmental Protection Agency
Coastal Communities Project

- **What?**
  - Water Quality Outreach & Education resources

- **Who?**
  - Our smaller coastal communities

- **Why?**
  - To remove barriers for city staff

- **How?**
  - A One-Stop-Shop for resources

www.coastalcommunitiesstx.com
Outreach Toolbox & Roadmap

- Project website
- Roadmap messaging
- H-GAC & partner resources
- Model ordinances
- Links to funding, training, and meeting opportunities

www.coastalcommunitiestx.com
Outreach Toolbox & Roadmap

Four Focus Behaviors

- Pet Waste Disposal
- Disposal of Fats, Oils, & Grease (FOG)
- Litter & Illegal Dumping
- Maintenance of On-Site Sewage Facilities (OSSFs)
The Roadmap Messaging

Please Pick Up my Poop.
Pet Waste Pollutes.
It makes a mess. It spreads disease. It adds bacteria to our water.
Learn more at petwastepollutes.org
The Roadmap Messaging (cont.)

**NO WIPES IN THE PIPES**
Only flush toilet paper - NOTHING ELSE

Items like wipes, paper towels, and other hygiene products might be flushable but don't break down so they get caught in the pipes and cause sewer system backups.

This costs cities and residents more $$$$
The Roadmap Messaging (cont.)

This Labor Day make sure your trash does not end up in our waterways so we can enjoy celebrating outside for years to come!

-Litter is the leading cause of debris, plastic, and trash along our roads and streets. Often people litter and assume that others will pick up behind them, or that there is someone employed to keep the streets clean. We are all responsible for our trash, plastic and recyclables.

Litter is carelessly discarded refuse
- Beverage containers, plastic bags, cigarette butts, snack wrappers, paper, and fast food containers/wrappers, light construction debris etc., etc., etc.
- Can be intentional or unintentional
  - Additionally not bagging up and disposing of grass clippings (another form of litter) clogs drains and contributes to the drainage issues.
  - Whether intentional or not we must all do our part to work towards a clean litter free community.

#LoveWhereyouLive #BayCityTx

58
19 Comments 17 Shares
Expanding the Toolbox

- Expanding the Resources
  - Engaging more communities
  - Working with partners on a Community-Based Social Marketing Pilot Project
    - Combatting improper FOG disposal in apartments
Hands-on Exhibits & Posters

A variety of other brochures created by partner organizations may be available. Availability of reports and other documents should be discussed with project managers.

LOW IMPACT DESIGN DISPLAY AND MATERIALS

PITCH THE POOP INTERACTIVE GAME AND MATERIALS

PLEDGE SHEETS FOR ALL THREE DISPLAYS

FREDDIE THE FISH PRESENTATION IS AVAILABLE FOR MORE FORMAL EDUCATION/OUTREACH SETTING.

H-GAC OUTREACH MATERIALS

MISCELLANEOUS INFORMATIONAL POSTERS; AVAILABLE LAMINATED AND/OR CORO/PLAST AND PDF FILES FOR PRINTING, EXCEPT TIMELINE.

WHAT CAN YOU DO?

WATER QUALITY BROCHURE (LEFT)

TRASH BASH EVERGREEN BROCHURE (BELOW)

WHAT WATERSHED DO YOU LIVE IN?

THE JOURNEY OF TRASH
Hands-on Exhibits & Posters

**THE TROUBLE WITH DOG POOP**
and how we can protect our waterways, one bag at a time.

We love our pups, but not the gutter little "gifts" they leave behind. Turns out our rivers, streams, and lakes don't like them, either.

There are:
900,000 Dogs in the Houston-Galveston Region
Colightly depositing 312 Tons of poop per day.

Which is the equivalent of 52 dump truck loads per day.

**RAIN WATER** washes poop left on the ground into our storm drains which connect to creeks and bayous where it decomposes. During decomposition, the poop uses up precious oxygen needed by fish and other creatures to stay alive and healthy.

Not to mention the risk of illness for swimmers and fisherman using the waterway...yuck!

**I Pledge...**

To Throw Pup's Poop Away, Not Leave It For Another Day.
I Will Not Leave It in the Rain, And Will Not Flush It Down the Drain.
Each and Every Time My Pup Poops, I Hereby Pledge to Stoop and Scoop.
Then Straight to the Can I Will Dash, And Put My Pup’s Poop in the Trash.

www.petwastepollutes.org

**This means that...**

You could be exposed to bacteria, viruses, and parasites that live in dog poop.
This can be quite dangerous to the old, young, and folks with compromised immune systems.
Pathogens are dangerous to kids playing in the yard, and they can contaminate anything edible growing in your garden.

**What can you do?**

Always pick up after your pet, no matter where it is.
Carry spare bags on your daily dog walk, and use them to encourage others to pick up after their poops!
If bags aren’t your thing, bury waste at a minimum of 5 inches in the ground and far away from your garden or well.

LEARN MORE about the effects of pet waste and what you can do to make a difference by visiting our website, www.petwastepollutes.org.
Hands-on Exhibits & Posters (cont.)

I PLEDGE...

To fight the **Grease Monster** in all his forms, And never let pouring grease down the drain become my norm.

Whether salad dressing or bacon grease, I hereby pledge to scrape and squeeze.

After each meal, quick as a flash, I will put the remnants in the trash.

To always make sure my drain stays clear With each and every meal I cook this year.

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**DON'T FEED THE GREASE MONSTER**

Bacteria is a common source of pollution in Texas waters. Improper disposal of fats, oils and grease (FOG) contributes to the problem.

**Where does FOG come from?**
- Meat
- Cooking oils, lard, shortening
- Butter & margarine
- Dairy products
- Mayo, salad dressings, sour cream

**Why does FOG matter?**
- Sticks to pipes from the sink to the sewer
- Causes sewage backups into homes, streets, and storm drains
- Pollutes local waters with raw sewage
- Costly repairs for homeowners and taxpayers

**What can YOU do?**
- No FOG or food scraps down the sink or garbage disposal
- Wipe grease off dishes before rinsing
- Flushing FOG with hot or cold water will NOT prevent grease build-up in pipes
- Call a professional rather than use chemicals to clear a grease clog

**GREASE: A MONSTER OF A PROBLEM**

Funded in part by the Texas Commission on Environmental Quality and Galveston Bay Study Program.
Hands-on Exhibits & Posters (cont.)

I PLEDGE...

To keep the storm drain clear,
Protecting it from pollutants far and near.

Whether yard chemicals in abundance or litter uncollected,
The presence of pollutants will leave our water affected.

So here and now I pledge to use LID to prevent,
Stormwater pollution to a major extent.

To ensure safe and clean water for our nation,
Protecting our water for future generations.

WHEN IT RAINS,
YOUR YARD DRAINS
Prevent Stormwater Pollution
Where It Starts

TEST YOUR KNOWLEDGE

T or F Runoff is rain that is not absorbed and ends up in the storm drain or nearest waterway.

T or F Stormwater runoff is not treated to remove pollutants.

T or F Residential properties are potential sources of many pollutants.
Hands-on Exhibits & Posters (cont.)

I PLEDGE...

To not be rash,
And not just throw something in the trash.

I will look before I throw,
To find the place where it should go.

Recycle, Reduce, and Reuse,
These are the options I will choose.

I will limit waste in all these ways,
So it doesn’t pollute our waterways.

Fish Me From The Watershed

and sort me where I go

reduce

Recycle

Reuse

@ home
@ retailers
@ the recycle center
household hazardous waste

# shows the type of plastic - to find where items can be recycled near you, visit Earth911.com

35% of trash in the U.S. is recycled annually
80% of marine debris comes from inland sources

*This project is funded in part with a grant from the United States Environmental Protection Agency through the Texas Commission on Environmental Quality’s Commonwealth Bay Outreach Program.
Trash Free Texas

- A Trash Free Waters project
- Key Goals:
  - Add “Adopt-A-Spots
  - Support local cleanup efforts
  - Help restaurants reduce single-use plastics

www.trashfreetexas.org
www.h-gac.com/trash-free-texas
Texas Stream Team

- Citizen Science volunteer water quality monitoring
- 3 Phases of Training
- Part of a state-wide program
- Trainings on hold

Contact:
stream.team@h-gac.com

h-gac.com/Texas-stream-team
Contact Information

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H-GAC’s Efforts to Improve the Region’s Water Quality

Urban Forestry and Riparian Cover
Justin Bower, Principal Planner

August 26, 2021
The Region’s Urban Forests
Houston’s Urban Forest

- Ecosystem services beyond aesthetics
  - Heat reduction
  - Flood mitigation
  - Health benefits
  - Water/air quality improvement
  - Biodiversity/habitat
  - Carbon reduction, etc.

- Focus of many local efforts
H-GAC’s Role

- Regional Coordination
- Regional Support
- Identifying/pursuing funding
- Data Analyses
- Potential funding role

Examples
- Houston Area Urban Forests
- City of Houston grants
- Cypress Creek CSP
Building Riparian Function

- Streamside areas are last line of defense
- Multiple benefits; flood, quality, habitat, etc.
- Applicable to urban, suburban, rural land uses
- Many existing programs

Examples
- Riparian Tool
- Focus in WPPs, etc.
For more information, contact:

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713-499-6653
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3555 Timmons Lane, Suite 120,
Houston, TX 77077
H-GAC’s Efforts to Improve the Region’s Water Quality

Green Infrastructure: Designing for Impact
Steven Johnston, Senior Planner

August 26, 2021
Why H-GAC?

www.h-gac.com/go/LID
LID/Green Infrastructure
(Survey)

Are your familiar with the terms Low Impact Development (LID) or Green Infrastructure?

Yes 91%
No 9%
Which LID or Green Infrastructure solutions do you think are most feasible or desirable?

- Stormwater wetlands: 83%
- Vegetative strips: 83%
- Bioswale: 64%
- Green roofs: 22%
- Cistern/rain barrel: 45%
Development Impacts: 2040

- Parking Spaces: 6M
- Non-Residential: 680M SQFT
- Residential: 3.5B SQFT
Development Impacts
1.4M More Single-Family Units

390 CINCO RANCHES

Source: Toll Brothers
Development Impacts

6M Parking Spaces

230 NRG Park Parking Lots

Source: Houston Chronicle
WHAT is Green Infrastructure?
Comprehensive Stormwater Management Method

HOW does Green Infrastructure work?
CAPTURES and DISTRIBUTES stormwater runoff throughout the site as close to the SOURCE as possible

WHERE can Green Infrastructure be used?
EVERYWHERE
New Development, Redevelopment, Parking Lots, and Roadways
What does it look like?

Permeable Pavement

Bioswale

Rain Garden

Rainwater Harvesting
What does it look like?

- Green Roofs
- Wetland Detention
- Underground Storage
- Planter Boxes
What does it look like?

Green Roofs

Wetland Detention

Bioswale/Planter Boxes

Rain Garden

Rainwater Harvesting
Benefits

- Improved Water Quality
- Cost-Effective
- More Space For More Stuff
- Reduce Potential Flood Impacts
- Multi-Functional
- Increased Property Values
Resources Available

- LID Website
- Workshops
- Regional Guidebook
DESIGNING FOR IMPACT
Regional Guide for Low Impact Development

- LID Overview
- Barriers/Solutions
- List of Best Practices
- Cost/Benefit Analysis: LID v. Conventional
- Local Case Studies
Case Studies
## Designing for Impact: Regional Guide for Green Infrastructure

### Barriers

#### Regulatory

<table>
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<tr>
<th>Barrier</th>
<th>Solution</th>
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<tbody>
<tr>
<td>Wide Min. Roadway Widths</td>
<td>Narrower Roadway Designs</td>
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<tr>
<td>Curb + Gutter Requirements</td>
<td>More Flexible Standards</td>
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<tr>
<td>Excessive Impervious Cover</td>
<td>Efficient Site Design</td>
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<tr>
<td>Lack of Incentives</td>
<td>Offer Incentives for LID</td>
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#### Perceptual

<table>
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<tr>
<th>Barrier</th>
<th>Reality</th>
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<tbody>
<tr>
<td>Is Cost Prohibitive</td>
<td>Reduces Costs + Adds Value</td>
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<tr>
<td>Don’t Know What it Is</td>
<td>Increase Awareness w/ Educ.</td>
</tr>
<tr>
<td>Is Too Difficult to Maintain</td>
<td>Maintenance Not Burdensome</td>
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<tr>
<td>Clay Soils Prevent its use</td>
<td>FALSE!</td>
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Web Page – Local Examples

Designing for Impact

As part of Designing for impact, H-GAC has created a mapping application that highlights various Low Impact Development (LID) projects across H-GAC's 13 county region. Click the sites on the map to see a project's location, photos, features and benefits. Projects are grouped based on development type:

- **Residential Development Projects (11 projects)**
- **Non-Residential Development Projects (25 projects)**
- **Mixed Use Development Projects (1 project)**
- **Open Space Development Projects (8 projects)**
- **Street Improvements (14 projects)**

Submit Your LID Project
Ghirardi Watersmart Park
League City, TX

Designing for Impact

3.75 acre Demonstration Park (Rain Gardens, Cistern, Pervious Pavement, Green Roof, and Bioswales) Features of the Ghirardi WaterSmart Park in League City include a tank to collect rain water and lowered wildflower beds that help to clean runoff.
What’s Next?

- Future Workshops
- Efficacy Study
  - Project to begin in September 2022
Steven Johnston
Senior Planner
Houston-Galveston Area Council
steven.johnston@h-gac.com

DESIGNING FOR IMPACT

https://www.h-gac.com/low-impact-development
H-GAC’s Efforts to Improve the Region’s Water Quality

H-GAC Bacteria Targeted Monitoring Project
Jessica Casillas, Planner

August 26, 2021
H-GAC Targeted Monitoring

- Bacteria is the most prevalent pollutant
- ~ 80% of the region’s streams fail to meet state water quality standards
H-GAC Targeted Monitoring

- PURPOSE
  - Identify bacteria sources
  - Report findings to appropriate jurisdictions for problem elimination
H-GAC Targeted Monitoring

Phase 1 - Data Analysis
Phase 2 - Monitoring
Phase 3 - Reporting

Photo credits: Environmental Institute of Houston, University of Houston-Clear Lake.
H-GAC Targeted Monitoring

Phase 1 - DATA ANALYSIS

- Identify assessment units and monitoring stations with the highest bacterial concentrations
- Calculate geometric means
- Categorize catchment areas as urban, suburban, or rural
- Work Group (Dec 10, 2019)
## H-GAC Targeted Monitoring

<table>
<thead>
<tr>
<th>Predominant Land Cover Type</th>
<th>AU ID</th>
<th>AU Name</th>
<th>Relative Bacteria Geomean</th>
<th>AU Length (miles)</th>
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<td>Cedar Creek (tributary of Dickinson Bayou)</td>
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<td>1.31</td>
</tr>
</tbody>
</table>
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- Four* AUs within City of Houston jurisdiction
  - *Greens Bayou partially within boundary
- Robinson Bayou and Cedar Creek within City of League City
- Gum Bayou within Dickinson
- Mustang Bayou mostly within City of Alvin
- White Oak Creek within City of Conroe jurisdiction
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- **Phase 2 – MONITORING**
  - Intensive desktop review
  - Windshield survey
    - Samples collected at major crossings
  - Field Investigation
    - Dry weather monitoring
    - Permitted flows sampled upstream and downstream
    - Unpermitted flows/tributaries sampled at source
  - NELAP testing

Photo credits: Environmental Institute of Houston, University of Houston-Clear Lake.
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**Phase 3 - REPORTING**

- Report findings to local authorities
- Recommendations to the Bacteria Implementation Group (BIG)
- Work with appropriate jurisdictions to implement bacteria reduction measures
- Follow-up monitoring and analysis as needed
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Progress

- TCEQ Approval on Oct 2020
- Windshield Surveys Conducted Jan – March 2021
- Field Investigations Conducted March – April 2021
- City of Houston Referrals (Summer 2021)
- City of League City Referrals (Summer 2021)
- Reports submitted to TCEQ (Aug 2021)
# H-GAC Targeted Monitoring

## Bacteria Monitoring Report

### White Oak Creek, Conroe, Texas

**Prepared by:**
- Donald Alverez, Program Support Specialist
- Kendal Guindo, Planner

Houston-Galveston Area Council (H-GAC)
PO Box 22777, Houston, TX 77227-2777

## Unnamed Tributary of White Oak Bayou (1017E_01)

**Bacteria Monitoring Report**

<table>
<thead>
<tr>
<th>AU ID</th>
<th>AU Name</th>
<th>Windshield Survey Sample Count</th>
<th>Field Investigation Sample Count</th>
<th>Referral Sites</th>
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*Not applicable*
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<th>Field Investigation Sample Count</th>
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<th>Percent of Samples &gt; State Standard</th>
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<tr>
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<tr>
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</tbody>
</table>
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QUESTIONS?

Jessie Casillas

Planner

Houston-Galveston Area Council

3555 Timmons Lane, Suite 120 Houston, TX 77027

Jessica.Casillas@h-gac.com

Direct | 713-993-4594

Project funded by TCEQ Clean Rivers Program.

Photo credits: Environmental Institute of Houston, University of Houston-Clear Lake.
Breakout Sessions Will Begin Now

Discussions will begin after a 5-minute break