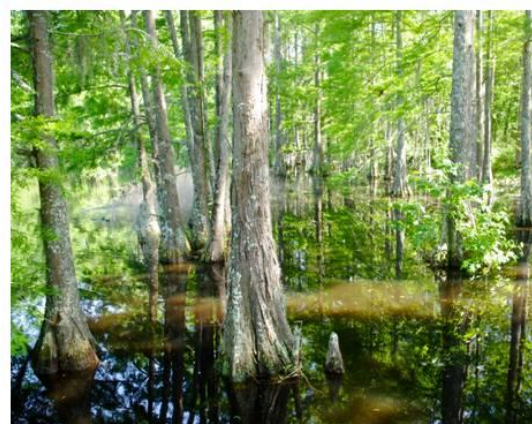


Water Quality Planning for the Houston-Galveston Region

Final Report, FY 2015



Funding for this project was provided by the Environmental Protection Agency through a Clean Water Act 604(b) grant to the Houston-Galveston Area Council, administered by the Texas Commission on Environmental Quality.



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Prepared by the Houston-Galveston Area Council, in coordination with the Texas Commission on Environmental Quality. This project was funded under a Clean Water Act Section 604(b) grant; TCEQ contract number 582-15-50104.

Houston Galveston Area Council

3555 Timmons Lane, Suite 120

Houston, TX 77027

For further information, please contact:

Justin Bower

Senior Environmental Planner

Houston-Galveston Area Council

713-499-6653

justin.bower@h-gac.com

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Acronyms

BMP	Best Management Practice
CCP	Coastal Communities Program
CWSRF	Clean Water State Revolving Fund
DMR	Discharge Monitoring Report
EPA	United States Environmental Protection Agency
FOG	Fats, Oils, and Grease
GIS	Geographic Information System(s)
H-GAC	Houston-Galveston Area Council
HHW	Household Hazardous Waste
MUD	Municipal Utility District
NPS	Nonpoint Source
OLD	Outfall Location Dataset
OSSF	On-Site Sewage Facility
PID	Permit Information Database
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
SABD	Service Area Boundary Dataset
SAS	Statistical Analysis Software
SEP	Supplemental Environmental Project(s)
SRF	State Revolving Fund
SSO	Sanitary Sewer Overflow
TCEQ	Texas Commission on Environmental Quality
TEHA	Texas Environmental Health Association
TMDL	Total Maximum Daily Load
TSSWCB	Texas State Soil and Water Conservation Board

TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
WCID	Water Conservation and Improvement District
WQMP	Water Quality Management Plan
WPP	Watershed Protection Plan
WWTF	Wastewater Treatment Facility

Executive Summary

This report summarizes Contract 582-15-50104 (Project), a 604b project administered by the Texas Commission on Environmental Quality (TCEQ). The Project entailed a series of five (5) data collection, special study, and coordination activity objectives¹ completed by the Houston-Galveston Area Council (H-GAC) in conjunction with the TCEQ. The purpose of these activities is to provide data and analysis regarding wastewater infrastructure, watershed planning, and sources of nonpoint source (NPS) pollution that impact water quality in the 13-county Houston Galveston area Region (Region) of the Upper Gulf Coast of Texas. This document² is a summary of the results of these efforts, and a discussion of future needs.

Objective 2 – Quality Assurance – This objective involved the maintenance and renewal of two existing Quality Assurance Project Plans (QAPPs): the Regional Water Quality Data Acquisition and Compilation QAPP (Data QAPP) for the collection and assessment of the various data sources described under Objective 3; and the Regional Geospatial Data QAPP (Geospatial QAPP) for the collection and analysis of geospatial data as described in Objective 6 (Subtasks 6.1 and 6.2 related to OSSF database maintenance). The following tasks were completed:

- A **QAPP meeting** was held (as part of a general post-award meeting) on 9/25/2014 between H-GAC and TCEQ staff, along with continuing conversations throughout the Project term (Task 2.1)
- Annual Reviews of the **Data** and **Geospatial QAPPs** were completed and submitted by H-GAC, and approved by TCEQ and EPA.

Objective 3 - Wastewater Data Update and Coordination – Objective 3 of this Project involved the continued development and maintenance of a series of integrated wastewater treatment facility (WWTF) datasets, the review of State Revolving Fund (SRF) applications for compliance with regional data and aims, coordination of regional watershed management efforts, and an evaluation of bacteria data reported in WWTFs' discharge monitoring reports (DMRs). The following tasks were completed:

- Datasets containing spatial information related to **WWTF service area boundaries** and **permitted outfalls** were updated and amended to reflect changes and better reconcile with other related datasets (Task 3.1).
- The **WWTF permit information database** was updated with new permit information, reviewed for outdated or erroneous data, and then compared against the service area boundaries and outfall location datasets. Effluent data from Discharge Monitoring Reports was acquired and incorporated for use in a wide array of watershed,

¹ These five water quality objectives are Objectives 2-6 of the Project. Objective 1 – Administration, and Objective 7 – Final Report are not discussed separately, but are referenced in relation to other Objectives.

² Due to size and length considerations, some documents or deliverables are provided on the enclosed DVD, as noted in the Report.

wastewater infrastructure, and other related projects³ (Task 3.2). Staff reviewed updated TCEQ online databases to identify points of redundancy to address in future projects.

- H-GAC reviewed **six** applications to the **State Revolving Fund** (SRF), and provided formal comment to the TCEQ (Task 3.3).

Objective 4 - Support Watershed Planning— Objective 4 involved support of watershed planning in the San Bernard River watershed and general coordination and support for regional watershed and water quality efforts. The following tasks were completed:

- Continued **stakeholder coordination** for the San Bernard WPP projects was facilitated by H-GAC. A planned partnership meeting was postponed based on delay in WPP modeling and review by TCEQ. However, H-GAC staff did update presentations to a variety of key stakeholder groups in its place. Staff also coordinated with or participated in several partner efforts, and made several distributed contacts through individual calls to key partners (Task 4.1).
- H-GAC provided general **watershed/water quality management coordination** through the staffing and facilitation of the Natural Resources Advisory Committee, coordination of data and efforts with ongoing Total Maximum Daily Load (TMDL) and Watershed Protection Plan (WPP) projects, sending liaisons to a variety of local water quality and watershed organizations including the Galveston Bay Estuary Program’s Water and Sediment Quality subcommittee, and coordinating efforts between other H-GAC environmental efforts and this Project (Task 4.2).

Objective 5 – Coastal Nonpoint Source Program Coordination – For the fifth objective, H-GAC continued to maintain communication with its program participants, and disseminated grant and funding opportunities as appropriate. The update was part of an ongoing program to prioritize support for local needs that impact NPS issues in these communities. In addition, H-GAC provided support and services to help the program communities to meet needs related to a nonpoint source impact. A program website was developed to host model materials, funding resources, and other pertinent information. Lastly, H-GAC engaged local stakeholders in reviewing potential funding opportunities and involvement with the RESTORE Act funding process. The following tasks were completed:

- H-GAC facilitated continued **program maintenance** for the Coastal Communities project through materials disseminated by email and on its website. (Tasks 5.1).
- H-GAC **provided coordination and resource support services** to the program participants and other small coastal communities including assisting with TWDB funding application data; identifying potential funding sources; coordinating with a corresponding coastal stormwater BMP study through the University of Texas; coordinating with a Houston Wilderness-led project to generate a regional conservation

³ These data collection and analysis activities took place under the auspices of the H-GAC Regional Water Quality Data Acquisition and Compilation QAPP.

plan and attract funding from RESTORE and other sources; assisting the City of Morgan's Point on a coastal prairie/open space restoration project; and disseminating grant opportunity and programmatic resources information to all participants (Task 5.2).

- In addition, H-GAC maintained a **program website**⁴ to host program resources, funding opportunities, and related information relevant to our program participants (Task 5.1).

Objective 6 - OSSF Database Update – In fulfillment of Objective 6, H-GAC updated and expanded an existing GIS database of regional on-site sewage facility (OSSF) locations and a spatial projection of likely locations for unpermitted systems⁵. The following tasks were completed:

- The **OSSF location database** was updated with new data received during the contract period (Tasks 6.1).
- The **unpermitted OSSF methodology** was reviewed and updated by H-GAC staff. (Task 6.2)

⁴ www.coastalcommunitiestx.com

⁵ These data collection and analysis activities took place under the auspices of the H-GAC Regional Geospatial Data QAPP.

Introduction

This document is the culminating report for the fiscal year 2015 efforts conducted under 604b-funded Contract 582-15-50104 (Project) between the H-GAC and the TCEQ. The Project involved acquiring, compiling and evaluating water and wastewater data, and a series of special studies and coordination activities. The purpose of the Project is to support current and future planning decisions concerning water quality efforts, wastewater infrastructure development, watershed management, coastal nonpoint source management, and related issues on both a regional and state level.

The 13-county Houston-Galveston Area Region (Region) has a variety of water quality concerns and developmental challenges. The majority of our local water bodies are impaired under state water quality standards, and our developmental patterns have resulted in a relatively patchwork and diffuse network of wastewater infrastructure. With population expected to expand dramatically in the coming decades, the ability to make informed decisions regarding water quality and wastewater infrastructure development will be a key tool in planning for the Region's future. The background of this Project is discussed in the **Project Significance and Background** section. The efforts summarized in this document serve to advance these purposes through a series of specific studies and the maintenance of regional datasets for local use and in support of the state's Water Quality Management Plan.

This report will focus on the progress achieved in the five primary objectives⁶ set forth in the Project:

- Quality Assurance
- Wastewater Data Update and Coordination
- Support Watershed Planning
- Coastal NPS Program Coordination
- OSSF Database Update

Each of these primary tasks serves to maintain, expand or implement the H-GAC's store of water quality and wastewater infrastructure data, or provide related services to the Region. Each objective is explained in greater depth later in the **Project Studies and Coordination Activities** section.

The Project required a series of interim deliverables related to these tasks. A description of the methodologies employed to generate outcomes is provided in the **Methods** section. Some of the deliverables are generated as large electronic datasets, unsuitable for full inclusion in a printed version of this final report⁷. However, representative pieces of each deliverable are

⁶ Objective 1 (Project Administration) and Objective 7 (Final Report) are not specifically reported on in this document, as they relate only to the maintenance of the contract and the development of this document.

⁷ Copies of these electronic data are contained within the media that accompanies this report, and have been provided under separate cover.

included, and all Project outcomes are discussed in the **Results and Observations** section. The synthesis of the information gathered and tasks implemented under this Project is discussed in the **Discussion** and **Summary** sections. Additional information and standalone reports completed for some deliverables are provided in the **Appendices**.

Project Significance and Background

Background

The Region has experienced robust economic expansion over the last several decades. That expansion resulted in a proportional increase in population growth and resulting land development. While this has been a boon to local prosperity, increased population and development also carry with them the challenges for our utility infrastructure and the potential for increased impact on our local waterways. With 3.5 to 4 million more residents expected by 2040, these challenges will only be exacerbated by future population growth.

The majority of the stream segments in the Houston area are listed on the State of Texas's list of impaired water bodies (303d list). An overwhelming majority of the region's segments are unable to meet one or more state water quality standards. The most common source of impairment is elevated bacteria levels in excess of the contact recreation standard. Other development related issues like low dissolved oxygen, PCBs, and dioxins are also present in some water bodies. The bacteria in our lakes, creeks, streams and bayous comes from a variety of sources, including human waste, domestic animal waste, pet waste, and wildlife. These wastes may enter the water through point sources, i.e. discrete "end of pipe" discharges, or diffusely through nonpoint sources, carried in precipitation flowing over the land. While some bacteria are naturally occurring, development brings with it additional bacterial sources and a greater potential impact to water bodies unless careful planning is employed.

The wastewater infrastructure that serves the Region's increasing population has expanded and developed much like the Region itself. The availability to fund infrastructure through political subdivisions like Municipal Utility Districts (MUDs) and other special districts allowed for a wastewater treatment network that is relatively widespread and diffuse rather than limited by the bounds of a traditional, centralized model. The resulting patchwork of regional wastewater infrastructure development offers both future challenges and opportunities for local decision-makers. These challenges are best served by the accumulation, maintenance and application of regional wastewater and effluent quality data to inform regional decisions. As management measures designed to deal with the current and potential water and wastewater infrastructure issues are put into place, the need for coordinated, regional sources of information becomes plain.

Under previous 604b projects, H-GAC has sought to address aspects of the information and data needs related to the water quality issues the Region faces. These projects have typically been a mix of ongoing efforts and short term special studies. Some of the project efforts have been continuous (wastewater data collection and maintenance, etc.) while others have been standalone research efforts relating to specific data needs or questions (GIS analyses for infrastructure consolidation, Phase II stormwater permit implementation, etc.). This balance allows the long term accumulation of data while retaining flexibility to address specific issues. The ongoing efforts in the FY15 Project focused on updating and improving existing regional

wastewater infrastructure databases and spatial datasets of OSSF locations, providing nonpoint source management support to small coastal communities, and supporting local watershed protection planning. Short term/special study efforts include facilitating watershed planning efforts for the San Bernard River, a regional priority watershed.

Significance

From a regional perspective, the water quality and wastewater infrastructure decisions facing our local areas are more effectively considered on a watershed basis, as contaminants do not adhere to political boundaries along waterways. This is especially important for watersheds that serve as significant drinking water sources, like Lake Houston. In order to provide useful information and viable recommendations, a large store of relevant and accessible data is necessary.

The data collection and analysis tasks completed under this Project have significant value for a variety of efforts in the Region, benefitting local watershed protection planning, wastewater infrastructure planning, and program development.

The significance of the efforts undertaken in this Project is demonstrated by the variety of capacities in which the outcomes are used:

- **Internal data collection and regional data sharing** – The wastewater permit data, service area boundaries, and OSSF location data collected/created under this Project serve to augment existing datasets, inform project decisions on related efforts, and expand internal abilities of both the H-GAC and TCEQ to incorporate and produce future data and analyses. For example, this year’s data was used by the Houston-area Bacteria Implementation Group (BIG) TMDL effort; the San Bernard River, Cedar Bayou, and Bastrop Bayou WPPs; the Clean Rivers Program; the Trust for Public Land’s Lake Houston Greenprint project; and in the planning activities of a variety of local governments and organizations.
- **Regional project coordination** – Maintaining and expanding regional data resources allow the H-GAC and TCEQ to better understand and facilitate regional efforts between parties involved in wastewater infrastructure decisions, and general water quality/watershed protection efforts (WPP and TMDL efforts, etc.) Participation in regional groups and efforts helps ensure decisions benefit from project resources and expand the reach of the project’s aims through partner efforts.
- **Source water protection** – A large portion of the Region’s population is served by treated surface water that originates in our local rivers and lakes. The infrastructure planning and watershed coordination activities of this Project fostered greater understanding of the issues facing surface water drinking sources.
- **Project review** – Data and analyses allow H-GAC Project staff to assist state and federal granting agencies in review of regional grant applications. These reviews ensure that potential projects concur with regional priorities and regional data projections.

- **Education and outreach** – Data gathered under this project has been used as a focal point or basis for several educational efforts, including the OSSF location database, and various facilitated meetings like the ongoing Natural Resources Advisory Committee.
- **Coastal NPS program development**– The continuation of the Coastal Communities Program focuses on supporting efforts by the participating communities and other small coastal communities to access funding and support to reduce point source and NPS issues.

Project Objectives

This section details the background, process and outcomes for the five Objectives that represent the component efforts of this year's Project (*Objectives 1 and 7 of the Project are administrative tasks and Final Report requirements, and therefore are not reported on this document*).

Objective 2: Quality Assurance

This objective includes tasks related to maintenance and update of two existing Quality Assurance Project Plans (QAPPs): the Regional Water Quality Data Acquisition and Compilation QAPP (Data QAPP) for acquisition, compilation and assessment of TPDES permit data and related information as part of Objective 3; the Regional Geospatial Data QAPP (Geospatial QAPP) for the collection and analysis of geospatial data as described in Objectives 4 and 6; and the San Bernard River Watershed Modeling QAPP, for watershed modeling.

The purpose of this objective is to ensure all data are collected and analyzed in a manner appropriate for the data objectives of the Project.

Task 2.1 – QAPP Meeting

H-GAC and TCEQ met to formally discuss the QAPP needs for the project as part of a project kickoff conversation on 9/25/2014 after the initiation of the contract. The outcome of the meeting was a confirmation of the elements covered by each QAPP. Informal discussions regarding the maintenance and update of the QAPPs occurred continuously throughout the project term, including the annual certification for the Data and Geospatial QAPPs.

Task 2.2 – QAPP

The existing QAPPs were maintained during this time period, with updates and revisions made as part of Task 2.3.

Task 2.3 – QAPP Updates/Amendments

H-GAC amended the Data QAPP and the Geospatial QAPP for content and for annual certification. The revised versions were submitted and approved by TCEQ and EPA.

Objective 3: Water Quality Management Plan Review, Update and Coordination

This objective includes tasks related to wastewater infrastructure data collection, dataset update and management, and SRF project proposal reviews.

H-GAC maintains a series of datasets related to TPDES-permitted wastewater infrastructure facilities in the region. They are the **Service Area Boundaries Dataset (SABD)**, the **Outfall**

Locations Database (OLD), and the **Permit Information Database (PID)**. A primary task under this Project is to update and continue to integrate these data sources.

Task 3.1 - Service Area Boundaries

The SABD is the spatial representation of the wastewater dischargers' service area boundaries. Typically, this boundary data include municipalities, public districts (MUDs, WCIDs, etc) and private utilities.

During previous annual Projects, the SABD was modified to integrate it with the Permit Information Database (PID) and the Outfall Location Dataset (OLD) directly in a shared GIS, to allow data updates to be shared across platforms directly, rather than through duplicated effort.

H-GAC GIS staff accumulated and integrated service area boundaries during this project term on an ongoing basis. The current version of the SABD is included in digital format on the media accompanying this report.

Task 3.2 - Wastewater Database Maintenance

In addition to the SABD, H-GAC maintains two other sets of data, the Outfall Location Database, a GIS layer, and the Permit Information Database, a Microsoft Access database.

Outfall Location Database (OLD) – The OLD is a companion dataset to the SABD, and maintains the outfall location of each permitted wastewater outfall. TCEQ updates are the initial source of this dataset, as precise outfall location coordinates are not provided in permit documents (only general descriptions of the outfall path). However, when H-GAC receives data from individual permit holders or other sources that contradicts TCEQ data, staff members review the conflicting data against the existing records.

During this project period, staff conducted an integration review after incorporating the most recent version of TCEQ data. As part of the review process, project staff compared the existing dataset with the most current TCEQ dataset and the TCEQ Central Registry permit entries to identify and resolve any discrepancies. Subsequent to this review, the outfall dataset was compared to the PID to ensure that each outfall record in the PID had a corresponding outfall location. Based on the review, H-GAC generated a list of discrepancies for TCEQ's review. The primary source of discrepancies was a mismatch between an outfall status and a permit status in the Central registry or typos in permit numbers.

Permit Information Database (PID) – The PID is the collecting point for wastewater discharge permit data from regulated wastewater dischargers across the region. The H-GAC receives copies of WWTF permit information from the TCEQ, and incorporates it into a centralized, queryable Access database. The data H-GAC receives includes new permits, permit renewals, permit modifications, notices of permit applications/renewal applications, preliminary decisions on permit applications/renewal applications, and

permit information updates⁸. From these documents, all relevant information is extracted into pre-determined fields. These fields include name of discharger, name of facility, addresses, EPA and TCEQ permit numbers, capacity and permitted flow requirements, contaminant limits, outfall path, and other identifying data and regulatory restrictions.

Two updates occurred during this Project term, bringing the PID current with data received through at least 6/1/2015. The H-GAC Project Manager conducted a quality control audit for the data entry on at least 10% of the data. No appreciable errors were found. The current database includes records for 1506 permits, representing well over 2000 individual outfalls. A screenshot of the database format is attached as Figure 1.

The screenshot displays the 'WWTP Permits Database' interface. At the top, it shows '31 Of 1506 Permits'. The main form is divided into several sections:

- Capacity Dates:** 75%, 90%, Last Expansion, WQMP Year.
- Permit Information:** TCEQ Permit Number (WQ0003713000), EPA Permit Number (TX0118427), Permit Status (Active), Permit Type (Industrial).
- Holder and Facility:** Permit Holder Name (Chemicals Incorporated), Common Name (Hatcherville Plant), MUD (checked).
- Addresses:** Legal Address (12321 Hatcherville Road, Baytown, Texas 77521-7700), Plant Address (12321 Hatcherville Road), Cross Street 1 (Hatcherville Rd), Cross Street 2 (FM 1942).
- Contact:** Contact (Chitra Dhakal), E-mail, Phone Number ((281) 576-5000).
- Permit Dates:** Issued (10/14/2008), Expiration (8/1/2018), Last Renewal (2/26/2014).
- Principle Activity:** mfg process organic chemicals.
- Database Updates:** Entered By (Justin Bower), Date (4/21/2014), Update Type (Renewal).
- Permit SIC Codes:** Table with columns for SIC Code* and values like 2869.
- Permit Demographics:** Table with columns for Year*, Population, and Households.

Below the main form is the 'Outfall Information for Permit: WQ0003713000' section, which includes:

- Outfall Flow Information:** GIS Outfall ID (03713-000.001), Outfall Number (1), Active (checked).
- Other Information:** Bio Type (Not Required), Segment Group (Regulatory), Plant Outfall Location (to a country drainage ditch alongside Hatcherville Road; thence to a bermed county drainage ditch parallel and to the north of FM 1942; thence to Cedar Bayou Above Tidal in Segment 0902 of the Trinity-San Jacinto Coastal Basin).
- Primary Parameter Standards for Outfall: 03713-000.001**

Parameter*	Season Start*	Season Finish	Max	Grab	Interim	Daily	
CBOD5	January	December	Report	NA	<input type="checkbox"/>	50	D
COD	January	December	250	250	<input type="checkbox"/>	Report	D
Ecoli	January	December	Report	NA	<input type="checkbox"/>	Report	W
NH3N	January	December	Report	NA	<input type="checkbox"/>	Report	W
*					<input type="checkbox"/>		

Figure 1 - The Permit Information Database (PID)

⁸ It should be noted that H-GAC does not receive notices of permit expiration, abandonment, or administrative enforcement orders.

The data was checked for consistency across all outfalls of a single permit, and for consistency across all permits. It should be noted that while the PID and the SABD are integrated for those WWTFs that have boundaries, a 1:1 is not possible as boundaries do not exist for the majority of the industrial permits (which may serve a single parcel, and do not have traditional boundaries, but do have outfall locations). Over 1200 documents were processed during this year's updates.

Task 3.3 - State Revolving Fund

In conjunction with H-GAC's role as a regional planning group and the council of governments for the Houston-Galveston area of the Upper Gulf Coast, staff regularly provides comment on grant proposals of varying types. These reviews help to assure that regional goals were represented in project funding decisions at a variety of governmental levels.

H-GAC reviews the grant applications and associated engineering documentation (PER, Environmental Review, population projections) for concurrence with regional planning goals. Specifically, staff looked for:

- Population projections that matched TWDB, H-GAC or other relevant forecasts
- Consideration of alternatives that may impact water quality considerations
- Concurrence with regional priorities and goals (water quality impacts, etc.)

As part of this Project, H-GAC staff used data gathered under this and previous projects to provide comment on **six (6)** State Revolving Fund (SRF) projects for the TCEQ. The outcomes of the reviews are shown in Table 1 below.

Table 1 – Projects Reviewed in FY 2014

Granting Agency	Project ID#	Requesting Entity	Project Summary	Findings	Notes
TWDB CWSRF	73676	City of Houston	Rehabilitation of multiple wastewater systems/infrastructure.	Support	Sent letter of support. Annual multi-area project.
TWDB CWSRF	73697	City of El Campo	Planning study to evaluate reuse of WWTF effluent.	Support	Sent letter of support.
TWDB CWSRF	73702	City of Houston	Rehabilitation of multiple wastewater systems/infrastructure.	Support	Sent letter of support. Annual multi-area project.
TWDB CWSRF	73706	Harris County MUD 50	Rehabilitation of sanitary sewer collection system elements	Support	Sent letter of support.
TWDB CWSRF	73712	Harris County MUD 22	Rehabilitation of sanitary sewer collection system elements	Support	Sent letter of support.
TWDB CWSRF	73713	City of Liberty	Planning and design for rehabilitation and resizing of sanitary sewer collection system elements	Support	Sent letter of support.

Objective 4 - Support Watershed Planning

Objective 4 provides targeted support for ongoing source water and watershed planning in priority watersheds of the region. The efforts under this objective include continued stakeholder group maintenance for the San Bernard River Watershed and its WPP (Tasks 4.1) and general coordination with other regional water quality efforts (Task 4.2).

4.1 - San Bernard River WPP Coordination

H-GAC has established a Watershed Protection Plan effort in the San Bernard River Watershed through previous 319h grants from the TCEQ. During this project, staff worked with TCEQ to revise the Watershed Protection Plan and to maintain an active and engaged stakeholder base. Due to delays in the approval of the WPP and related modeling, H-GAC staff gave their project update through presentations at key partner meetings rather than a single project meeting. In discussion with TCEQ staff, this was subsequently determined to meet the deliverable for this task, as it achieved the same goal with equal or greater effort. Speaking engagements, events, and efforts related to this subtask are summarized in Table 2.

Table 2 - San Bernard River Stakeholder Events

Date	Event	Participation
Various	NRAC	H-GAC gave intermittent brief updates to the NRAC on the WPP progress at quarterly meetings.
Various	WPP revisions	H-GAC revised the WPP in response to TSSWCB and TCEQ comments, etc. in conjunction with the FY14 604b project.
10/27-10/28/14	TSSWCB Annual Meeting	H-GAC represented the San Bernard WPP at a meeting of several hundred agricultural producers and Soil and Water Conservation Districts. H-GAC manned a booth and engaged area stakeholders one on one.
4/19/15	Migration Celebration	H-GAC maintained a booth at the nature-oriented festival in the San Bernard watershed. Project staff discussed the San Bernard WPP, the watershed in general, and related topics with several hundred visitors.

Additionally, H-GAC coordinated with several stakeholders through the year on various projects including participation in regional efforts to encourage RESTORE act investment in the Upper Texas Gulf Coast, and specific stakeholders engaged in reopening the mouth of the San Bernard River (a priority concern for the project stakeholders).

Task 4.2 - Coordination

As an extension of H-GAC's role as a coordinator of regional planning efforts in a variety of fields, project staff members develop and maintain relationships with other local and state governments, community groups, and other organizations involved in efforts related to the aims of this Project.

Staff members facilitate the H-GAC's Natural Resources Advisory Committee, which provides policy recommendations for the H-GAC's Board of Directors, and serves as a regional roundtable for coordinating environmental efforts. The NRAC provides an efficient communication network and point of contact for H-GAC staff with other local and regional water quality decision makers, and four (4) meetings were held during the original Project term. The topics discussed at these meetings included the Gulf-Houston Regional Conservation Plan and Galveston Bay (November 2014); coastal resiliency and water supply (February 2015); conservation project planning and impacts of spaceport development (May 2015); and the Lake Houston Watershed (August 2015). Additionally, staff discussed ongoing natural resources legislation in the then-current legislative session. Project staff members also routinely attend meetings of, or otherwise support, a variety of other organizations involved in water quality efforts. This project term, staff helped coordinate activities with a wide variety of organizations. An example of these groups that staff worked with this year includes:

- Coordination with the Clean Rivers Program on the development of the Basin Highlights Report and other CRP efforts.
- Coordination with TCEQ on developing a project to address watershed planning in the Lake Houston watershed.
- Coordination with the Trust for Public Land on a Greenprint project addressing water quality and land management in the Lake Houston watershed.
- Identified and tracked natural resource legislation for the 2014-2015 Texas Legislature session. The information was provided solely for regional governments and stakeholders to educate themselves, and no support or opposition was offered or implied by H-GAC, or on behalf of TCEQ. The summary reports contained only a list of bills with short descriptions, and a link to more information on the Texas Legislature website.
- Promotion of OSSF data collection efforts relating to Objective 6, and other water quality efforts through presence and speaking engagements with a variety of conferences including the Harris County Annual OSSF meeting, Texas Watershed Stewards trainings, the Texas Watershed Coordinators Roundtable, and other watershed coordinator meetings at the local and regional level.
- The Galveston Bay Estuary Program – Water and Sediment Committee membership and leadership (Justin Bower is vice-chair of the Committee).

- A variety of interactions with state and local policy and regulatory efforts (including coordination with ongoing TMDL, Watershed Protection Plan, and other efforts). Some projects of specific note are:
 - Bacteria Implementation Group (BIG) and Upper Oyster Creek TMDL Implementation Plans
 - Cedar Bayou, San Bernard River, and Bastrop Bayou Watershed Protection Plans
 - The Gulf Coast Regional Conservation Plan group for Houston

In addition to facilitating regional communication, coordination, and cooperation on water quality efforts through staff presence and participation, H-GAC also uses the data generated under this project to support various internal and external project needs.

Objective 5 – Coastal NPS Development

While many communities in the Region are covered by MS4 storm water permits, there are a large number of small communities with known NPS issues who have received less attention and have less access, or less knowledge of, existing resources that could mitigate challenges they face and lessen the impact of NPS sources in their communities. Of specific interest to the Region are those small communities in our coastal counties that may impact our coastal bays and estuaries.

Under the FY12 604b project, H-GAC initiated a Coastal Communities Program to evaluate the needs of these communities, the nexus of those needs with NPS contributions, and potential services that would serve elements of the communities' needs while alleviating NPS pollution. During this Project term, H-GAC maintained the program, disseminating resources to coastal communities, and taking part in broader regional discussions and projects concerning coastal funding priorities. A specific project for the Morgan's Point community (not previously part of the program) was developed to take advantage of an opportunity to maintain water quality through land conservation.

Task 5.1 – Coastal NPS Program Maintenance

The primary focus of this year's Program effort was to make program resources and services available to the participating communities. The following services or products were delivered to the participants:

- A **program website** (www.coastalcommunitiestx.com) was maintained for disseminating information to participants. The website hosts model programmatic resources, previous year's assessments, information on funding resources, information on events of interest (RESTORE Act, etc.), and project updates. Branding elements for the program were developed as part of this effort. Figure 3 is a screenshot of the website landing page.
- **Grant opportunities** were disseminated to the program participants as they were developed. Examples of grant announcements disseminated include the RESTORE Act information, TWDB SRF solicitations, and other coastal environmental opportunities.

Task 5.2 – Coordination and Resource Support

While no individual communities took advantage of H-GAC services during this project year, H-GAC continued to maintain relationships and investigate potential opportunities. Additionally, project staff coordinated with large regional efforts which promised to have direct benefit for the participant communities and coastal zone. A highlight of the efforts was providing support for the City of Morgan's Point on a land management planning project.

- **The City of Morgan's Point** is a small coastal community along the Houston Ship Channel/upper Galveston Bay system area in Harris County. The City contacted H-GAC project staff to discuss potential funding and planning resources related to conserving a 50 acre tract of undeveloped land for a variety of reasons, including reducing impervious cover and runoff. H-GAC staff worked with the City to identify a series of funding options, set up meetings with various technical resource providers, and directly provide support for obtaining H-GAC internal resources. Currently the City has purchased the tract of land, and is working with H-GAC on developing solutions for a long-range plan and related funding resources.
- **RESTORE Act Representation** – As part of a large effort to ensure representation of the needs of coastal communities in the region, H-GAC took part in several meetings, seminars, and trainings surrounding the development of RESTORE Act funding priorities for the state of Texas. These meetings included trainings hosted by a local coalition of environmental organizations, and individual discussions and briefings with regional stakeholders. The intent of this representation is to ensure that the needs and NPS sources identified under this coastal program are part of the priority for funding/project selection. H-GAC served as part of a steering committee for the Houston-area Regional Conservation Plan project (facilitated by Houston Wilderness) which seeks to define conservation and remediation priorities for the coastal areas in the region, in advance of RESTORE and other coastal funding sources coming fully online. The Plan continued to develop this year, and H-GAC continued to press for inclusion of projects related to small coastal communities' needs.

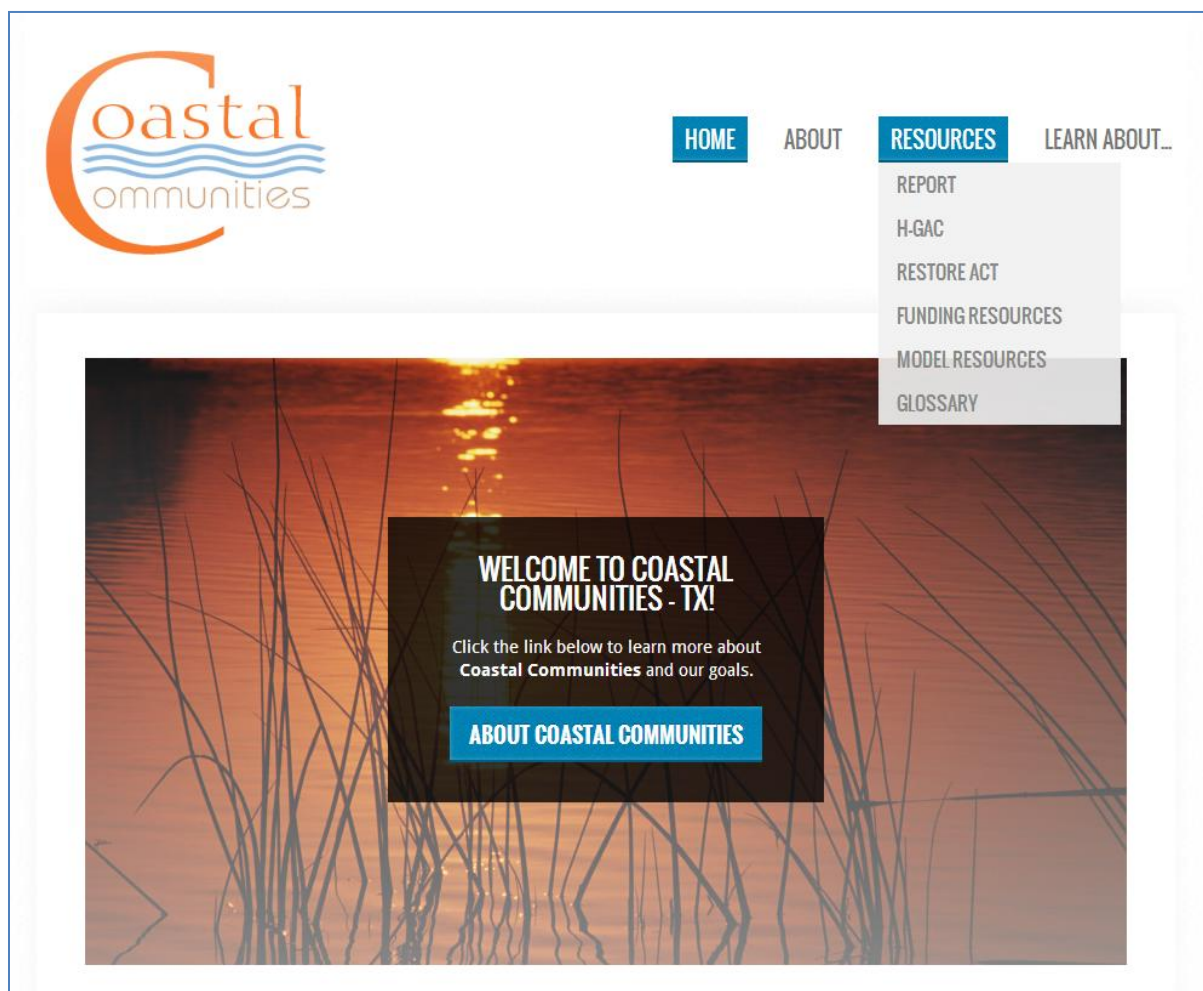


Figure 3 – Coastal Communities Program Website

Objective 6 – OSSF Database Update

On-Site Sewage Facilities (OSSFs), or septic systems, are a widespread wastewater treatment technology in the Region, especially in the developing counties on the Region’s borders. OSSFs are relied upon for the treatment and disposal of wastewater in areas not conducive to sanitary service, but can be appreciable sources of contamination. The Houston-Galveston Area Council estimates that there are over 300,000 OSSFs within the region. This constitutes, roughly, 13% of all OSSFs within the state of Texas. Annually thousands of additional OSSFs are designed, sited, and installed within the Region, especially in the rapidly developing unincorporated areas of northern Harris and Montgomery Counties, as well as the rural counties that reside along the Region’s periphery. While new systems are subject to permit requirements, systems older than 1989 may be grandfathered and specific locations may be unknown.

Authority over managing OSSF permitting is designated to Authorized Agents (counties, municipalities and other responsible entities), who have traditionally kept this data in a variety of formats. To ensure a regional, uniform set of data for use by Authorized Agents and water quality planning efforts, H-GAC developed a comprehensive inventory of permitted system locations and likely unpermitted system locations under previous grant contracts⁹.

During the 2015 Project, new data from the Authorized Agents and old data not previously converted were added to the OSSF permit database. Additionally, H-GAC staff updated the unpermitted OSSF location methodology.

Task 6.1 – Maintain OSSF Database

The intent of the existing OSSF database is to provide a comprehensive, spatially-explicit inventory for all permitted OSSF locations throughout the region. No such inventory existed prior to the initiation of H-GAC’s initial database development. The initial work had collected existing location data for permitted OSSFs and developed a program under which participating Authorized Agents would submit new system data on a regular basis, including spatial locations using GPS units provided by H-GAC¹⁰.

H-GAC added new records to the OSSF Permits Database in FY15, and removed outdated or bad data. Prior to the recent update, the database consisted of 88,710 records of permitted OSSFs. With the update, the database now contains 88,599 records. This update is a net decrease increase to the database total, but represents a large number of permit records removed (primarily in Austin County) based on more precise data. New permit data has continued to be updated throughout the year, but was less than the total number removed. The updated OSSF database is included in the digital media attached to this report.

Our partners have been very responsive with data submittals, partly in thanks to periodic efforts (monthly emails and/or calls as necessary) to remind them to submit data. Records submitted by Brazoria County, Chambers County, Fort Bend County, Galveston County, Liberty County, Montgomery County, Waller County, and Wharton County contained latitude and longitude coordinates of the location of the system’s septic or trash tank, allowing very precise siting. Permit Records received by the remaining Authorized Agents were geo-referenced, or identified on a map, by the permit address.

Project staff worked directly with several Authorized Agents to improve their data quality and submissions. However, for the most part data transmittal was efficient.

Task 6.2 – Update Unpermitted OSSFs

The OSSF inventory data developed by H-GAC under Task 5.1 dealt with permitted OSSFs. For most Agents, systems began to be permitted subsequent to 1989. OSSFs installed prior to this

⁹ The effort was initiated in an ARRA grant (Federal ID #96690301), and continued in previous years’ 604b projects.

¹⁰ Further information about the development of the database, the methodologies employed, and previous efforts can be found in the FY12-FY14 604b Final Reports and the Geospatial QAPP.

date were not required to have a permit and in most cases are not actively tracked unless violation data exists for that site. While many of these systems are well maintained, aging systems in general pose a greater threat of failure and contamination of surface water sources. These systems also potentially represent an appreciable portion of the systems in service. H-GAC devised and tested a methodology to use existing data to identify by process of deduction, likely locations for unpermitted systems. During this Project year, the identification methodology was re-run to update the analysis. The updated Unpermitted OSSF map is included in the digital media attached to this report.

In addition to these contract deliverables, H-GAC promoted our OSSF data resources at a variety of meetings and through speaking engagements (See Task 4.2). Project staff addressed a sizeable crowd of local OSSF installers, Authorized Agents, and related personnel at the Harris County OSSF Seminar on OSSF data and remediation options.

H-GAC has created, in conjunction with several other projects, a Supplemental Environmental Project (SEP) through TCEQ to remediate septic systems in the priority watersheds of the 13-county region. Throughout FY15, H-GAC staff promoted the SEP to permit holders through one on one contacts and events.

Methods

The following is a brief summary of the methods employed by Project staff, and their strategy and approach to each of the primary Objectives. The methods used, objective goals, and results for each are described in more detail in their respective sections in the Project Objectives section.

Objective 2: Quality Assurance

The general strategy employed by H-GAC was to first confirm that the new Project year tasks were covered under the existing QAPPs, and to implement the existing QAPPs. Annual Certifications were completed as required.

H-GAC utilized its existing QA/QC methods developed with TCEQ and other agencies over the course of many years of related projects, in application to the FY15 Project.

Objective 3: Water Quality Management Plan (WQMP) Review, Update and Coordination

The permit database updates were routine, and adhered to existing QAPPs and QC methods.

For the SRF coordination aspects of the Objective, Project staff maintained a manifest in which to log SRF and other project reviews, and in which transition time was monitored internally.

Objective 4: Support Watershed Planning

To foster the San Bernard WPP group, H-GAC maintained an active presence in the watershed and contact with key stakeholders. Due to the delay in the WPP review and approval process, H-GAC staff focused on informal periodic updates and maintaining a presence at community events. The WPP was revised based on TCEQ/TSSWCB comments.

Objective 5: Coastal NPS Program Development

The methods employed in the maintenance of the Coastal Communities Program focused on providing information and services to support the needs of the participant (and other) small coastal communities and representing them in broader regional efforts.

To meet the goal of generally maintaining the project, H-GAC focused on pushing information out to the participants whenever appropriate.

To meet the goal of providing services to the participants, H-GAC focused on identifying potential projects for which our services could be applied. H-GAC's methods in developing grant opportunities were to screen all grant possibilities, and disseminate those with relevant applicability. The approach with the participants was designed to be as community specific as possible, although the communities did not engage H-GAC in any specific projects beyond conceptualization. The website continued to be the approach that would allow a central

depository for information and a quick reference for all resources. The Morgan's Point project was the primary focus of this effort, as no other participant took advantage of our services.

Lastly, due to the lack of active requests from the participants, H-GAC worked to represent their interests in regional projects that would benefit them directly or indirectly (RESTORE Act planning, etc.)

Objective 6: OSSF Database Update

The methods employed in the update of the OSSF database and unpermitted OSSF analysis are described in further detail in the Geospatial QAPP. Generally, H-GAC maintained regular contact with submitting Authorized Agents, to ensure regular data submissions. H-GAC's methods for the unpermitted analysis were the same as previous project years, in which unpermitted locations were deduced through a comparison of known parcels, known OSSFs, and known sanitary sewer systems.

Methods Summary

In general, the methodical approach of the Project team for all tasks was to assess available data/resources, make a preliminary plan toward the task objective, periodically review the progress and plan, and make adjustments as necessary.

For those objectives dealing with public interaction, staff utilized existing communication networks and meetings to maximize the number of people reached, and incorporated feedback into revised versions of deliverables.

As much of the data and analysis developed under this Project will likely serve other water quality and watershed efforts, H-GAC coordinated with internal and external project managers to assure that the format and approach to these efforts would provide meaningful products.

To the greatest degree possible, project staff attempted to streamline and make uniform the methods and processes involved in the various Tasks to increase efficiency in future project years.

Results and Observations

This year's project was successful in building on progress made in last fiscal year's project, and providing a solid base for a number of regional efforts. The following observations will inform the approach to future iterations of this Project.

Objective 2, QAPP - The extent of QAPP coverage and the proactive approach to planning for annual certifications and other QAPP changes were generally successful.

Objective 3, WWTF Data – A significant number of permit documents were incorporated this year. To increase accuracy and improve QA, internal staff members were used rather than temp workers for data entry. Changes to TCEQ online hosting of permit documents was evaluated against the needs for data identified in other projects. Subsequent to the FY16 project year, the need for additional PID updates may be decreased.

Objective 4, Watershed Planning Support – The NRAC and H-GAC participation in other projects continues to be a valued part of this contract. The density of project work in the Houston area requires a good deal of coordination, communication, and cooperation. NRAC has continued to be well attended, and the legislative review was favorably received by the participants. While the San Bernard watershed planning process was delayed by WPP review, H-GAC staff members were able to complete significant WPP revisions and make contacts with key partners throughout the process in lieu of a single project meeting.

Objective 5, Coastal NPS Program Development – Active participation continued to be minimal, as primary needs were for large infrastructure financing or engineering work beyond the scope of this project. Additionally, many participants lack the necessary staff or capacity to take on items beyond their core infrastructure needs (which were overwhelmingly point-source related). However, The Morgan's Point project was serendipitous, as they had not previously been involved with the project. H-GAC was able to assist the City at a crucial juncture, and helped lead to on-the-ground impacts. Additionally, H-GAC's pivot to involve itself in larger regional efforts that will benefit these communities has been a productive use of time. Cooperation between the H-GAC and Houston area Regional Conservation Plan and this Project will continue to be beneficial to all parties.

Objective 6, OSSF Database Update – The OSSF data continues to be one of the most useful elements produced under this Project. It has already been used for a variety of watershed protection efforts. With the population expansion of the coming decades, and aging infrastructure, additional information about unpermitted system locations will be vital to utility planning. Future work should consider ways in which to account for OSSF abandonment in expanding sanitary sewer areas, which cannot be easily captured currently. In working with some key partners this year, this concept was discussed, but no readily feasible solutions emerged.

In general, H-GAC project staff members are confident in the results of this year's Project. H-GAC feels that the deliverables meet the needs of the current Project, and will provide a solid foundation for future work.

Results and observations specific to each task and objective of this Project are described in detail in their corresponding subsection of the **Project Objectives** section of this document.

Future needs identified during this year's Project are established in the **Discussion** section of this document.

Discussion

This section will detail the areas of need identified for inclusion in future projects, including any recommended solutions.

WWTF PID Sunsetting

The expansion/availability of TCEQ's online permit resources (scanned permits, queryable database, etc), the need for continued entry into H-GAC's database may no longer be needed. H-GAC project staff members are continuing to review regional data needs against any discrepancies between the two databases. If H-GAC is able to utilize the TCEQ database with our coordinated GIS datasets, the PID should be sunsetted after the FY16 project.

OSSF SEP support

H-GAC has implemented an SEP for OSSF remediation. However, the administration of the project is currently underfunded (the SEP funds do not include an administrative component). While most of the future administration is slated to come from 319(h), etc., projects utilizing the SEP in their project area, planning for oversight on a regional basis may be a potential role for H-GAC 604(b) efforts. Failing OSSFs are a prominent cause of bacterial contamination in the region, making them a priority target for water quality management planning.

Coastal Communities

While H-GAC is not able to provide some core service to the participants (infrastructure funding and engineering), there has been interest in expanded, comprehensive education and outreach to these communities. With this project effort as a base, additional funding opportunities through 319(h) may be able to implement some of the recommendations of previous years for the whole coastal area.

Summary

This year's Project was successful in updating WWTF infrastructure data for the Region, for the benefit of both local and state purposes. H-GAC continues to provide its unique regional perspective to the review of SRF projects.

H-GAC continues to develop and foster relationships with interested parties in the Region's watersheds, and coordinate regional water quality activities. We have been leaders in previous TMDL and WPP efforts, and the coordination activities of this Project mesh well with our overall approach of outreach, targeted studies and implementation activities. By having multiple water quality projects within the same organization, we are able to achieve a good vertical integration between base data sources, internal analysis, planning efforts (WPPs, TMDLs, etc), and external coordination.

The Coastal Communities Program has continued to be a source of information for participant communities, but has not attracted as many specific community projects as anticipated. The Morgan's Point project, however, has been a highlight of the intended purpose of the effort. H-GAC will continue to grow this effort with an eye toward potential future expansion to a stand-alone effort if appropriate.

The OSSF inventory development continued during this fiscal year. This deliverable remains one of our most popular efforts among internal and external clients.

This report, the accumulated datasets, the GIS analyses, and other deliverables of this Project are attached in electronic format on accompanying media. Where allowable and appropriate, data from this Project will be used to support other related efforts and/or made available (upon TCEQ approval) on H-GAC's website at <http://www.h-gac.com/community/water/quality>. This Final Report document, when approved, will be made available at this location.

Appendices

Appendix A – Summary of Materials included on Media

The following materials are included on the media attached with this Report:

- 1) Service Area Boundaries Dataset and map (GIS format) – Task 3.1
- 2) Permit Information Database (Microsoft Access database format) – Task 3.2
- 3) Permitted OSSFs (GIS format) – Task 6.1
- 4) Potential Non-Permitted Systems Location Map(image file) – Task 6.2
- 5) Final Report, digital version (Objective 7)