Implementation Strategy 2.0: Sanitary Sewer Systems

This implementation strategy focuses on the underground infrastructure (pipes), ancillary support processes (lift stations), and the management of the network of infrastructure that is connected to the wastewater treatment facility itself. Activities to be implemented in the wastewater treatment facilities are discussed in the previous section.

Sanitary sewers can fail to function properly due to blockages, line breaks, defects that allow storm water and groundwater to overload the system, lapses in operation, inadequate design and construction, power failures, and vandalism. The EPA has concluded that sanitary sewer overflows (SSOs) contribute to bacteria loading in almost all impaired streams, but may or may not be a primary source of loading. EPA acknowledges that SSO data is difficult to assess.[49]

In a Report to Congress, the EPA addressed the extent and possible solutions to human health and environmental impacts caused by SSOs.[50] In the Houston region, sanitary sewer systems are separate and not intentionally combined with storm water sewer systems. SSOs are untreated or partially treated discharges from sanitary sewers. "SSOs can range in volume from one gallon to millions of gallons. The microbial pathogens and other pollutants present in SSOs can cause or contribute to water quality impairments, beach closures, shellfish bed closures, contamination of drinking water supplies, and other environmental and human health problems."[51]

Based on estimates presented in the TMDL reports or draft technical documents, an average of 77 overflows were reported each month, representing a monthly average of over 700,000 gallons. Overflows were reported in all but two watersheds.

In general, implementation actions consist of encouraging improvements to sanitary sewers; reducing the amount of fats, oils, and grease entering the systems; addressing lift station inadequacies; improving reporting of violations; strengthening controls on subscriber systems;[52] maintaining an accurate map of sanitary sewer coverage; and evaluating the penalty structure for SSOs and other sanitary sewer violations.

[49] (U.S. Environmental Protection Agency 2004)

[50] (U.S. Environmental Protection Agency 2004)

[51] (U.S. Environmental Protection Agency 2004)

[52] A subscriber system is a sewer system that conveys flow to a wastewater treatment facility that is owned by a separate entity. The term is not intended to indicate individual private laterals, such as a homeowner's connection to a sewer system.

Implementation Activity 2.1: Develop Utility Asset Management Programs for Sanitary Sewer Systems

A utility asset management plans (UAMP) is a common-sense, proactive approach to managing, maintaining, and operating a sanitary sewer system. The EPA's Capacity, Management, Operation, and Maintenance (CMOM) is probably the most well-known UAMP. This section uses CMOM as a guide for this implementation activity but these programs are intended to function independently of the EPA unless the system's owner or operator requests its technical or other assistance.

UAMPs provide a framework for self-evaluation and planning for the function, condition, and performance of a sanitary sewer system. Currently, UAMPs are voluntary in Texas, although the TCEQ or EPA can require them through a consent decree or administrative order. To facilitate the development and implementation of many elements of UAMPs, the TCEQ offers the Sanitary Sewer Overflow Initiative (SSOI), a voluntary program to improve a system's operation. Some operators have voluntarily implemented a program as a means to improve performance and reduce costs. It should be understood that UAMP elements will vary with requirements and circumstances of individual entities. For example, a small, well-run system with fewer than a dozen connections would have a simple program, possibly described in less than two pages. A large or problematic system would have a substantial UAMP, proportional to its size or problems. Therefore, the BIG does not recommend that the TCEQ, the EPA, or other regulators develop or use a 'standard format.'

2.1.1: Require a UAMP Plan as part of Wastewater permits

All permits for new WWTFs discharging to a stream within the BIG project area shall include a UAMP plan. Starting five years from the approval of the I-Plan, all permit renewals for WWTFs discharging to a stream within the BIG project area shall include a UAMP plan. As allowable by law, the UAMP plan should apply to any subscriber systems that contribute to the WWTF.[53]

Operators of existing systems are encouraged to develop a UAMP plan prior to the inclusion of these requirements in a permit. In general, components of the UAMP plan will include clearly stated goals, a description of the organization, the permittee's legal authority, an overflow emergency response plan, measures and activities, design and performance standards, a capacity assurance plan, provisions for self audits, and a communication plan. Activities specified in the plan might include lift station maintenance, provision of alternative power sources such as generators for lift stations, periodic manhole surveys that include cover levels and wall condition, periodic line cleaning, and condition surveys. More details and resources for plan development are provided in Appendix D.

[53] See sample language in "Model NPDES Permit Language for Sanitary Sewer Overflows (draft)" (U.S. Environmental Protection Agency 2007)

Operators of sanitary sewer systems are encouraged to seek technical assistance from either the TCEQ or the EPA as appropriate, although the oversight of neither agency is a requirement of the program. Owners and operators are encouraged to consider participating in the TCEQ's voluntary SSOI program as a means to improve system performance and to facilitate development of an appropriate UAMP plan. The TCEQ's Small Business and Local Government Assistance program is also a source of technical assistance.[54] Minimum elements of the UAMP plan would include the provision of updated coverage maps, confirmation of subscriber system registration (see Implementation Activity 2.5), and improved reporting requirements (see Implementation Activity 2.4). As resources are available, H-GAC shall collect and make available copies of UAMP, CMOM, and SSOI plans for reference.

The TCEQ is encouraged to make facilities that do not have a UAMP plan, and facilities that are not implementing their UAMP plan, higher priorities for inspections and enforcement.

2.1.2: Develop a series of webcasts and meetings to provide introductory information about UAMPs

H-GAC, the TCEQ, or another appropriate entity shall offer a series of meetings geared toward local sanitary sewer owners, operators, and engineers, providing introductory information about UAMPs. Meeting topics may include a description of the problems presented by sanitary sewer systems, a definition of CMOM, an outline of EPA guidelines, case studies, and a description of benefits such as cost savings, cost avoidances, and pollution reduction. In an effort to make the information accessible to an expanded audience, the meetings will be recorded and made available in a webcast format during the meeting and as an online archive. Potential development partners include the Water Environment Association of Texas, the TCEQ, the Water Environment Research Foundation, the EPA, the Texas Water Utility Association, the Texas Rural Water Association, and the Association of Water Board Directors – Texas. Continuing education credits should be given to operators for participation in training related to UAMP.

Implementation Activity 2.2: Address Fats, Oils, and Grease

Fats, oils, and grease are considered to be the leading cause of blockages in sanitary sewers, and the EPA estimates that blockages account for nearly 50 percent of all SSOs.[55] This implementation activity encourages local governmental entities to require owners of sanitary sewer systems to determine the proper size for grease traps, to inspect them, and to require grease traps be properly cleaned and

[54] See also "Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems" (U.S. Evironmental Protection Agency 2005)

[55] (U.S. Environmental Protection Agency 2004)

otherwise maintained. H-GAC, in consultation with stakeholders and as resources allow, shall develop model language to facilitate the adoption of appropriate legal mechanisms.

The TCEQ developed a model ordinance in response to the Texas 78th State Legislature's amendment of the Texas Water Code, and created standards for managing grease stoppages in utilities' sanitary sewer lines.[56] The City of Houston incorporated elements of the model language into its Code of Ordinances in 2007.[57]

Possible topics for public education include efforts targeted at reducing fats, oils, and grease from residences and multi-family dwellings. Available resources include the *Can Your Fats*[58] brochure developed by Harris County and the City of Houston, the City of Houston's *Corral the Grease* program[59] and the TCEQ's *Let's Tackle the Grease in This Kitchen*[60] poster and video.

Implementation Activity 2.3: Encourage Appropriate Mechanisms to Maintain Function at Lift Stations

Occasionally, lift stations may cease to function and may discharge sewage into waterways, as demonstrated during the extensive power outages following Hurricane Ike in 2008. Lift stations may also fail to function during circumstances other than power outages, such as mechanical failure or repair.

Lift station operators are encouraged to undertake appropriate actions to maintain function of lift stations during power outages and other situations. Operators shall develop a comprehensive plan, possibly part of the UAMP plan, to address such situations. Appropriate mechanisms for inclusion in the plan might include installing underground power lines to lift stations, negotiating with power providers to reclassify lift stations as a higher priority for service restoration, installing solar-powered generators, developing partnerships with transportation partners to allow hybrid vehicles to serve as mobile generators, installing quick-connects if the use of mobile generators is necessary, using by-pass pumps, or using a wireless remote system. Conventional generators, whether fueled by natural gas or diesel fuel, might also be appropriate. Owners and operators are strongly encouraged to install quick-connects at lift stations. Quick-connects allow the quick connection of lift stations to alternative power sources

[56] See Tex. Water Code Ann. § 26.0491 (2010) (Model Standards to Prevent Discharge of Untreated Wastewater from Sanitary Sewers). (State of Texas 2004)

[57] See Houston, Tex., Code of Ordinances, Chapter 47, Article 7 (2008). (City of Houston 2008)

[58] (Harris County & City of Houston 2009)

[59] (City of Houston 2007)

[60] (TCEQ 2007)

such as mobile generators without the need for time-consuming and expensive facility modifications during a post-storm or other failure.

Implementation Activity 2.4: Improve Reporting Requirements for Sanitary Sewer Overflows

Current EPA regulations specify reporting requirements for noncompliance, including SSOs, in 40 C.F.R. §§ 122.41(1) (6) and (7) (2011).

2.4.1: Implement statewide database to record reported SSOs, allowing operators of sanitary sewer systems to enter information directly into State of Texas Environmental Electronic Reporting System

The TCEQ should further develop its system to allow collection, analysis, and dissemination of this information. This action is not intended to increase the data-entry requirements for TCEQ staff; instead, it is intended to streamline reporting and analysis.

2.4.2: Develop ability for communities to use statewide database to record reported SSOs

The existing TCEQ database security features require a broadband Internet connection for access. Until all sanitary sewer operators have access to a broadband Internet connection, database reporting should not be required.

In 2009, using American Recovery and Reinvestment Act funds, the Texas Department of Agriculture began mapping the coverage of broadband Internet access in Texas.[61] Once areas without coverage have been identified, funds may be available to develop coverage in rural areas, including all of the non-urban areas of the BIG region.

Once a statewide database is available and all communities in the BIG project area have the ability to report electronically, operators' permits shall require them to utilize the database to report SSOs.

2.4.3: Require reporting of SSOs to local programs

EPA regulations allow WWTF permits to include requirements that SSOs be reported to local programs, such as those of cities and counties. The statewide database described in the preceding section should be developed to include reporting capabilities that would allow the program to automatically alert local governments about SSOs.

[61] See Connected Texas website(Connected Texas 2010)

Implementation Activity 2.5: Strengthen Controls on Subscriber Systems

Subscriber systems are those systems that do not operate their own WWTFs or have their own permits, but instead enter into contracts with permitted WWTFs. (The term subscriber system is not intended to include private laterals such as those connecting a private residence to a sanitary sewer system.) While the exact linear footage of subscriber sanitary sewers in the project area is unknown, it is also unknown whether the contracts that WWTFs have with subscriber systems provide adequate controls and responsibility for operation, management, and maintenance of the subscriber system. Contracts could be developed to require appropriate controls.

2.5.1: Identify subscriber systems

Two approaches shall be taken to identify subscriber systems. First, as resources are available, H-GAC shall contact WWTF permittees and ask them to provide information regarding subscriber systems. Second, the BIG can petition the TCEQ for rulemaking to require registration of subscriber systems. As resources are available, H-GAC or another appropriate agency shall distribute information about subscriber systems. If stakeholder concerns regarding subscriber systems remain after five years, the BIG may consider consulting with the TCEQ to address subscriber systems or petitioning the TCEQ to require that subscriber systems have their own wastewater discharge permits.

2.5.2: Develop model contracts

As resources are available, H-GAC shall work with attorneys for WWTFs, municipal utility districts (MUDs), and other stakeholders to develop model contract documents. Contracts might address operation or maintenance requirements, rights to inspect or repair, flow reduction incentives, flow metering, and the ability to pass on fines or other financial burdens resulting from violations of permit requirements and for unauthorized discharges.

2.5.3: Provide a circuit rider program to work with WWTF permittees and subscriber systems to strengthen subscription contracts

As resources are available, H-GAC shall provide a circuit rider program to review and evaluate subscription contracts and implement terms identified in this section. This program would proceed on a voluntary basis by watershed, using the geographic prioritization framework recommended by the BIG and described later in this I-Plan. As part of the program, education on UAMP, metering, and UAMP development assistance could be provided. Appropriate WWTFs, MUDs, and their attorneys and accountants would be expected to participate.

Implementation Activity 2.6: Restructure Penalties for Violations

The TCEQ's existing penalties do not always deter poor maintenance or operation of sanitary sewer systems. Instead, some may consider penalties for sanitary sewer violations to be a cost of doing business that is less expensive than fixing the problem. The TCEQ should evaluate penalties and recommend changes for consideration.

The TCEQ recently revised its Penalty Policy #3 to address concerns raised during its most recent Sunset review. Furthermore, the legislature changed the rules for Supplemental Environmental Project (SEP) money to allow penalties to be spent on system repairs. The BIG requests that by March 1, 2017, the TCEQ shall analyze and provide a report on the effectiveness of the new policy and rules during the first five years of their implementation in the BIG project area. TCEQ shall review the report to determine whether the changes have caused the desired effects of deterring repeat violations and encouraging repairs to systems.

Upon evaluation of the report, the BIG shall determine whether to petition the TCEQ for further rulemaking if, in its opinion, the report does not indicate adequate progress.

Appendix J: Load Reduction Value Information

Due to the large number of TMDLs covered by this I-Plan and the imprecise bacteria loading values from various sources, estimated load reductions more specific than those given in the following sections could not be determined. Load reductions for each source will vary from segment to segment based on a variety of factors including, but not limited to, the existing land uses in the watersheds and the current loadings from each source.

These load reduction percentages are not based on results of any direct, peer-reviewed, or technically supported studies performed on pathogens or fecal indicators in waterways in the greater Houston area. Many of the estimated reductions are presumptions based on the broad application of the referenced pollutant studies and behavior predictions, some of which are not specifically water related. Also, as this is only a presumed reduction in fecal load; it is still undetermined how this estimated reduction in fecal load would translate to reduction in fecal indicators or the level of pathogens in the water body. Given the untested nature of this information in our area, these estimated potential load reduction percentages should be considered as broad approximations based on limited information and subject to a large margin of error. More due diligence and validation should be required prior to obligating resources based on them.

Although the load reductions presented in the following sections may be less than the load reductions required by the TMDLs, the BIG intends that greater load reductions may be achieved through the iterative process of implementation. The ultimate goal of this I-Plan is continued progress toward greatly reduced bacteria levels.

Implementation Strategy 1.0: Wastewater Treatment Facilities (IS1)

10 percent-20 percent reduction in load assigned to WWTFs

The estimated load reductions for the seven main activities within IS1 range from zero to 45 percent of the load assigned to WWTF. Based on studies of compliance and enforcement in other fields, the hypothesis is that the strategy with the greatest potential for reducing loads would be improved compliance and enforcement, although concerns exist that resources available are insufficient to attain the full reduction estimate. Over 25 years these seven activities could result in a reduction of up to 20 percent in the load assigned to WWTF.

Implementation Activity 1.1: Impose More Rigorous Bacteria Monitoring Requirements is expected to reduce the waste load allocation assigned to WWTFs by 2-4 percent. The hypothesis is that this action will function in a manner similar to mass communication to change public behavior, which is typically

about 2 percent for public health campaigns.[145] In this instance, the behavior changes are mandated by permits, and so participation is expected to be greater than for campaigns directed at the general public.

Implementation Activity 1.3: Increase Compliance and Enforcement by the TCEQ is expected to reduce the waste load allocation assigned to WWTFs by up to 45 percent. In a study of random unannounced inspections of tobacco retailers over seven years regarding underage sales, compliance increased to approximately 90 percent when compliance began at 33 percent.[146] Targeted inspections at WWTFs may not show such a marked increase in compliance because they go after the repeat offenders and will start to leave out those consistently in compliance. Additionally, WWTF inspections look at numerous regulations as opposed to the one considered in the tobacco studies, which results in a greater opportunity for noncompliance. If only compliance with bacteria limits were considered for when measuring compliance trends would likely behave closer to the tobacco study results than otherwise.

Implementation Activity 1.5: Upgrade Facilities is expected to reduce the waste load allocation assigned to WWTFs by 12 percent. TCEQ data indicates that, at any one time, samples from 5-10 percent of select WWTFs in the BIG area do not meet the single grab sample limit of 197 *E. coli*/100 mL. This estimate of a 12 percent reduction, as a result of the implementation of 1.5, was based on a 6 percent non-compliance rate for WWTFs and the average concentration of *E. coli* samples during sampling of WWTFs between 2001 and 2006 in the Buffalo and Whiteoak Bayou watersheds.[147] In actuality, the loading from many plants would not be reduced at all by updates, while for some WWTFs, the load reduction from making updates would be far more substantial than 12 percent. Load reductions will probably not be 12 percent for any individual plant.

Implementation Activity 1.6: Consider Regionalization of WWTFs is estimated to produce no reduction in the waste load allocation assigned to WWTFs except in segments where chronically non-compliant WWTFs are identified and subsequently made compliant or regionalized. In these particular segments the reduction will be estimated after identification of the chronically non-compliant facilities is complete.

Implementation Strategy 2.0: Sanitary Sewer Systems (IS2)

75 percent reduction of calculated load from reported SSOs

The estimated load reduction for the six main activities within IS2 range from zero to 75 percent of the load from reported SSOs. Based on staff estimates, UAMP may substantially reduce the number of SSOs

[145] (Abroms and Maibach 2008)

[146] (Lally 2000)

[147] (TCEQ 2009a)

and the causes of those violations. Reported SSOs represent only a portion of the loading from sanitary sewer systems, however it should be possible to address most SSOs.

Implementation Strategy 3.0: On-Site Sewage Facilities (IS3)

75 percent reduction of current load from OSSF

The estimated load reduction from the three main activities within IS3 is a 75 percent reduction of the current load from OSSFs over 25 years. The TMDL projects identify approximately 2,100 failing OSSFs in the BIG region. Replacing or repairing 100 failing systems each year over 25 years is possible. Other measures should compensate for the expected increase in the number of systems that fail within the next 25 years. Of particular note is a Galveston County study that indicated that 20-46 percent of surveyed participants changed their behavior based on educational material.[148]

Implementation Strategy 4.0: Storm Water and Land Development (IS4)

20 percent reduction in loading from storm water each year, compounded

The estimated annual load reduction from the six main activities within IS4 is 20 percent. Studies indicate that individual activities can range from increasing bacterial loads to a 99 percent reduction. In the absence of better data, analogous studies pertaining to other constituents in large scale development, as documented in *The Practice of Low Impact Development* sponsored by the U.S. Department of Housing and Urban Development, suggest a range of values in various situations, but can be conservatively be averaged to be about 20 percent.[149] Implementation activities related to storm water are expected to reduce bacteria loading from storm water and land development by up to 20 percent over the entire implementation process.

Implementation Strategy 5.0: Construction (IS5)

Up to 85 percent reduction in loading from construction sites

Up to an 85 percent annual load reduction is estimated from the main activity within IS5. Effectiveness studies for construction site best management practices have largely focused on removal of sediment from runoff. Subsequently, information regarding the effectiveness of erosion and sediment control measures at removing bacteria from runoff is lacking and sediment removal efficiencies are often used as a surrogate for bacteria removal efficiencies. A Virginia Implementation Plan, *A Total Maximum Daily*

[148] (Galveston County Health District 1998)

[149] (NAHB Research Center, Inc. 2003)

Table 22: Implementation Strategy 2.0: Sanitary Sewer Systems (SSS)

(a) Causes/ Sources	(b) Implementation Activities and Targeted Critical Areas	(c) Estimated Potential Load Reduction	(d) Technical and Financial Assistance Needed for Each Activity	(e) Education Component for Each Activity	(f) Schedule of Implementation for Each Activity	(g) Interim, Measureable Milestones for Each Activity	(h) Indicators to Measure Progress	(i) Monitoring Component	(j) Responsible Entity
Sanitary Sewer System (SSS) failures.	Implementation Activity 2.1 (IA 2.1): Develop Utility Asset Management Programs (UAMPs) for SSS	IAs 2.1 to 2.6, combined, over 25 years, may result in a 50% reduction in calculated bacteria loading from SSSs as identified in the TMDL projects.	Technical- Assistance from EPA, TCEQ, WEAT, and private consultants may be necessary to develop UAMP plans for individual systems. Technical assistance for EPA's CMOM program and TCEQ's SSOI program may be helpful. Financial- existing local funding and grant funding when available	Workshops presented by TCEQ, WEAT, H-GAC, and other entities Existing resources Occasional e-mails between stakeholders	Year One: Begin developing UAMP plans for individual SSS; begin developing workshops Year Two: TCEQ to begin adding UAMP requirements to new WWTF permits Year Six: TCEQ to begin adding UAMP requirements to all WWTF permits being renewed Continuing, as permits are renewed: updates to UAMP plans, implementation of UAMP plans	After five years, eight workshops held After ten years, all WWTF have UAMP plans	Reports provided by stakeholders to the BIG regarding progress	H-GAC will collect reports from SSS owners/ operators and TCEQ.	SSS owners/ operators: develop UAMP plan; report progress to BIG H-GAC: collect and share information on the progress made each year; facilitate workshops BIG: Evaluate progress TCEQ: Add UAMP provisions to TPDES permits for WWTF as described, provide technical assistance
Sanitary Sewer System (SSS) failures.	Implementation Activity 2.2 (IA 2.2): Address fats, oils, and grease	IAs 2.1 to 2.6, combined, over 25 year, may result in a 50% reduction in calculated bacteria loading from SSSs as identified in the TMDL projects.	Technical- regulations, ordinances, and orders of other communities, as collected and shared by H-GAC and/or TCEQ, may serve as models. Legal assistance may be necessary for individual communities EPA, TCEQ, WEAT, and other agencies offer some technical resources. Financial- existing local funding and grant funding as available	Provision of example and model language provided on website Jurisdictions who choose to change or add regulations will need to offer public comment and participation as appropriate. Distribution of website and collateral educational material related to fats, oils, and grease.	As resources are available, implementation of this activity will begin immediately and will continue for the entire implementation process.	Compile and share all existing regulations in project area within five years Each community shall examine their regulations and policies within five years One community shall adopt new regulation every five years Flyers or other collateral material distributed Website created and distributed	Information included in annual reports to the BIG Number of new regulations Number of flyers or other collateral material distributed Number of website visits	H-GAC will collect reports from stakeholders	Cities, counties, special purpose districts, and TCEQ: Examine relevant regulations and make changes as appropriate; report progress H-GAC: collect and share information about communities' regulations; collect and share information on the progress made each year BIG: Evaluate progress

(a) Causes/ Sources	(b) Implementation Activities and Targeted Critical Areas	(c) Estimated Potential Load Reduction	(d) Technical and Financial Assistance Needed for Each Activity	(e) Education Component for Each Activity	(f) Schedule of Implementation for Each Activity	(g) Interim, Measureable Milestones for Each Activity	(h) Indicators to Measure Progress	(i) Monitoring Component	(j) Responsible Entity
Sanitary Sewer System (SSS) failures.	Implementation Activity 2.3 (IA 2.3): Encourage appropriate mechanisms to maintain function at lift stations	IAs 2.1 to 2.6, combined, over 25 year, may result in a 50% reduction in calculated bacteria loading from SSSs as identified in the TMDL projects.	Technical- Assistance from private consultants, EPA, TCEQ, and other entities may be necessary to develop appropriate mechanisms for individual lift stations Financial- existing local funding and grant funding as available	Educational components for this activity will be conducted as part of IA 2.1	As resources are available, implementation of this activity will begin immediately and will continue for the entire implementation process.	10% of SSS shall be compliant with recommendations every five years for 25 years	Information included in annual reports to the BIG Number of systems in compliance with recommendations	H-GAC will collect reports from stakeholders	Cities, counties, special purpose districts, and TCEQ: develop and deploy appropriate mechanisms; report progress to BIG H-GAC: collect and share information on the progress made each year BIG: Evaluate progress
Sanitary Sewer System (SSS) failures.	Implementation Activity 2.4 (IA 2.4): Improve reporting requirements for SSOs	IAs 2.1 to 2.6, combined, over 25 year, may result in a 50% reduction in calculated bacteria loading from SSSs as identified in the TMDL projects.	Technical- EPA and TCEQ will require technical assistance to develop appropriate database and reporting technologies SSS owners/operators may need broadband internet access or equivalent Financial- existing local funding and grant funding as available	TCEQ/EPA shall provide appropriate instructions to SSS operators for using statewide database	As resources are available, implementation of this activity will begin immediately and will continue for the entire implementation process. Within five years, EPA/TCEQ will have developed appropriate database and technology for collecting and sharing information regarding SSOs Following the deployment of the database, SSS owner/operators shall begin using the database	Deployment of an appropriate database for tracking SSOs SSO reports available in five years from database	Creation of database Number of reports in the database Number of SSS owner/operators reporting SSOs	H-GAC will collect information from TCEQ	EPA/TCEQ: develop and deploy database; report progress to BIG SSS owner/operators: report SSOs as appropriate H-GAC: collect and share information on the progress made each year BIG: Evaluate progress

(a) Causes/ Sources	(b) Implementation Activities and Targeted Critical Areas	(c) Estimated Potential Load Reduction	(d) Technical and Financial Assistance Needed for Each Activity	(e) Education Component for Each Activity	(f) Schedule of Implementation for Each Activity	(g) Interim, Measureable Milestones for Each Activity	(h) Indicators to Measure Progress	(i) Monitoring Component	(j) Responsible Entity
Sanitary Sewer System (SSS) failures.	Implementation Activity 2.5 (IA 2.5): Strengthen controls on subscriber systems	IAs 2.1 to 2.6, combined, may result in a 50% reduction in calculated bacteria loading from SSSs as identified in the TMDL projects is expected over 25 years.	Technical- TCEQ will need to be able to develop a registry of subscriber systems SSS owners/operators will need legal and technical assistance to review and improve contracts with subscribers Financial- existing local funding and grant funding as available	Circuit rider program to inform and assist SSO owners/ operators	As resources are available, implementation of this activity will begin immediately and will continue for the entire implementation process. By year three: Develop model contract language Within three years: As resources are available, H-GAC shall begin offering a circuit rider program; begin contract reviews and modifications Within five years, TCEQ/H-GAC shall have a list of subscriber systems in the project area	List of subscriber systems Model contract language developed 5 contract renewals incorporating model language each year starting in year five	Information included in annual reports to the BIG Creation of subscriber registry Number of subscribers in registry Number of contract renewals incorporating model language each year starting in year five	H-GAC will collect reports from stakeholders	TCEQ: develop and deploy registry; report progress to BIG SSS/WWTF owner/operators: report any improvements to contracts; provide information regarding subscribers H-GAC: collect and share information on the progress made each year; manage circuit rider program BIG: Evaluate progress
Sanitary Sewer System (SSS) failures.	Implementation Activity 2.6 (IA 2.6): Restructure penalties for SSS violations	IAs 2.1 to 2.6, combined, may result in a 50% reduction in calculated bacteria loading from SSSs as identified in the TMDL projects is expected over 25 years.	Technical- Legal assistance may be necessary Financial- existing local funding and grant funding as available	TCEQ shall offer a public participation process as appropriate	Within five years, have appropriate penalty structure revisions in place	Within five years, have appropriate penalty structure revisions in place	Revised penalty structure for SSS violations	H-GAC will collect reports from stakeholders, including TCEQ	TCEQ: revise penalty structure H-GAC: collect and share information on the progress made each year BIG: Evaluate progress