

WSQ FOCUS AREA

Issue Area: Improve Water Quality Through Nonpoint Source Pollution Abatement

PRIORITY ISSUE	ISSUE AREA DESCRIPTION	SPECIFIC OBJECTIVES	ACTION	MEASURE	TARGETED OUTPUTS* (Short, Medium, Long-term)	GALVESTON BAY PLAN AREA	SAP AREA	LEAD IMPLEMENTERS	STATUS (Projects & Accomplishments)	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	
Nonpoint Source (NPS) Pollutants Cause Impairments to the Region's Waters.	Watershed Based Plans	Support Watershed Based Plan Development and Implementation.	Develop and implement local watershed based plans, i.e. watershed protection plans (WPPs) and total maximum daily load (TMDL) implementation plans (I-Plans) with local partners and stakeholders.	Number of Plans Supported and in Implementation.	S: Support the development of two Watershed Based Plans (20% completion of goal).	NPS-1, NPS-2, NPS-5, NPS-10, NPS-11, NPS-14, NPS-15, NPS-16	<i>Ecosystem and Human Health - WSQ Goal 1 Reduce NPS Pollutant Loads Objective A.</i>	WSQ, TCEQ, TSSWCB, TX AGRILIFE, GBF, H-GAC, and Future Watershed Partners	<ul style="list-style-type: none"> There are 6 WPPs (Bastrop Bayou, Highland Bayou, Dickinson Bayou, Cedar Bayou, Double Bayou, and West Fork of the San Jacinto River) being developed or completed. There are 3 TMDL I-Plans (BIG, Dickinson, Oyster Waters) developed or completed. Cease the Grease, LID projects, boater waste education, stormwater wetlands, and Construction Permit Education are other examples of actions being implemented. 	
			Identify target area(s) to schedule implementation by developing prioritization measures such as: relationship of water body to water quality standard; local source of funding or match available; ongoing watershed planning effort; size of waterbody; access to		M: Support the development of three additional (five total) Watershed Based Plans (50% completion of goal).					
					L: Support the development of five additional (ten total) Watershed Based Plans (100% completion of goal).					
	NPS Water Quality Improvement Projects	Support a Back the Bay NPS Education Campaign.	Apply a NPS outreach campaign to the target area(s) using completed GBEP Back the Bay message and brand to foster public awareness, education and encourage action to improve water quality.	Campaign Plan.	Campaign Completed.	S: Conduct initial survey of target population.	NPS-1, NPS-2, NPS-5, NPS-11, NPS-14, NPS-15, NPS-16, PPE-3, PPE-7	<i>Ecosystem and Human Health - WSQ Goal 1 Reduce NPS Pollutant Loads Objective B and F, Public Participation and Education - Public Education, Objective B.</i>	PPE, WSQ, TCEQ, TPWD, TSSWCB, TX AGRILIFE, GBF, H-GAC	<ul style="list-style-type: none"> Back the Bay messages and materials have been completed. EPA has developed a NPS Outreach Tool Box. Cease the Grease, Storm drain stenciling, Trash Bash, and pet waste public outreach messaging is available. GBF's Pump Don't Dump campaign aimed at educating boaters about hazards of sewage discharge and pump out alternatives. Clear Lake has been declared a no discharge zone. GBF looking at no discharge zone for Galveston Bay.
						S: Initiate target area campaign.				
				Target Population or Use Group Reached.		M: Track number of individuals involved, target populations or groups engaged				
						L: Track changes in public perception through follow-up evaluation/questionnaire.				
	NPS Water Quality Improvement Projects	Implement NPS best management practice demonstration projects.	Identify specific structural and non-structural measures to implement. Apply structural and nonstructural NPS best management practices to target area(s).	BMPs Demonstrations Installed.	Effectiveness Monitoring Data Evaluated, White Paper, Map BMP Locations.	S: Initiate two Best Management Practice demonstration projects.	NPS-2, NPS-5, NPS-11	<i>Ecosystem and Human Health - WSQ Goal 1 Reduce NPS Pollutant Loads Objective C.</i>	WSQ, TCEQ, TSSWCB, TX AGRILIFE, GBF, H-GAC, Local Governments, Development Community	<ul style="list-style-type: none"> Demonstration Projects include: <ul style="list-style-type: none"> Brays Bayou Wetland, Ghirardi Family Watersmart Park, HCFCD Detention with Water Quality Improvement Features, Birmamwood Dr., Almeda Rd.
						M: Initiate first three additional Best Management Practice demonstration projects (five in total).				
						L: Complete five Best Management Practice demonstration projects.				
				L: Evaluate demonstration project results and develop white paper on findings.						

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Nonpoint Source (NPS) Pollutants Cause Impairments to the Region's Waters. (continued)	NPS Water Quality Improvement Projects (continued)	Host NPS Workshops to Enhance Technical Understanding and Expand Use of Best Practices.	Provide NPS technical workshops in target area(s) to enhance the reach of structural and non-structural BMPs that address failing OSSFs, feral hogs, illicit discharges, illegal dumping, boater wastes and agricultural sources. Tie-in with Back the Bay messaging.	Initial Survey of Target Audience.	S: Conduct Best Management Practice awareness level surveys, prior to hosting workshops	NPS-1, NPS-2, NPS-5, NPS-11, NPS-14, NPS-15, NPS-16, PPE-3, PPE-7	Ecosystem and Human Health - WSQ Goal 1 Reduce NPS Pollutant Loads Objective D and E.	WSQ, TCEQ, TSSWCB, TX AGRILIFE, H-GAC	Ongoing efforts by H-GAC, Harris County, Texas Coastal Watershed Program, Texas A&M University: <ul style="list-style-type: none"> ● H-GAC OSSF website management ● Harris County Annual OSSF Seminar ● Harris County and East Aldine Management District OSSF abandonment ● H-GAC Real Estate Course ● AgriLife Extension OSSF Management Workshop ● TWRI's Lone Star Healthy Streams program targets agriculture producers with information on best practices.
				Workshops.	S: Conduct one Best Management Practice education workshop per year. M: Conduct one Best Management Practice education workshop per year.				
				Survey Attendee Follow up.	L: Conduct one Best Management Practice education workshop per year. L: Conduct Best Management Practice awareness level surveys, after hosting workshops				

*Measurable Action	Short-Term	Actions Conceived Completion within 2-5 Years
	Medium-Term	Actions Conceived Completion within 5-10 Years
	Long-Term	Actions Conceived Completion within 10+ Years

- Global M&R Element
- Global PPE Element
- Background Information / Resources Driving Plan Content

WSQ FOCUS AREA
Issue Area: Improve Water Quality Through Point Source Pollution Abatement

PRIORITY ISSUE	ISSUE AREA DESCRIPTION	SPECIFIC OBJECTIVES	ACTION	MEASURE	TARGETED OUTPUTS* (Short, Medium, Long-term)	GALVESTON BAY PLAN AREA	SAP AREA	LEAD IMPLEMENTERS	STATUS (Projects & Accomplishments)
(a)		(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Permitted Wastewater and Stormwater Systems can Contribute to the Region's Impaired Waters.	Stormwater PS Outreach	Implement a Back the Bay PS Campaign with Phase I and Phase II Stormwater Programs.	Collaborate Back the Bay PS campaign with owners and operators of Phase I and II municipal separate storm sewer systems (MS4s) on development and implementation of stormwater management programs to address sediment, litter, pet wastes, and illicit discharges from the MS4s. Best management practices (e.g. LID/Green Infrastructure, Construction BMPs, Illicit Discharge Detection Programs) and other water quality improvement techniques can be promoted.	Track MS4 Programs, Identify Collaborative Opportunities, Host or Promote Workshops, Promote Regional Messages, i.e. Cease the Grease, Trash Bash, GBAN, Patty Potty, Pet Waste.	<p>S: Develop database to track existing MS4 programs and identify opportunities for collaboration.</p> <p>S: Develop Outreach Plan to promote or host workshops and regional messaging campaigns to support Point Source education efforts (number TBD).</p> <p>M: Significant progress on executing Outreach Plan goals (50% complete).</p> <p>L: Significant progress on executing Outreach Plan goals (100% complete).</p> <p>L: Track success of workshops by identifying the number of MS4s implementing Best Management Practice measures.</p>	NPS-1, NPS-2, NPS-6, NPS-7, NPS-12, NPS-13, PS-5, SD-5, SD-6, SD-7	Ecosystem and Human Health - WSQ Goal 1 Reduce NPS Objective D, Goal 2 Maintain Capacity and Integrity of Municipal Sanitary Sewer Collection Systems to Eliminate Sewage Bypasses and Unauthorized Overflows Objective B. Public Participation and Education - Public Education, Objective B.	WSQ, PPE, TCEQ, Local MS4s, H-GAC	<ul style="list-style-type: none"> MS4s are beginning to address impaired waters through measures described in their Stormwater Management Plans. H-GAC hosts Clean Water Initiative Workshops that cover topics related to the MS4 permit requirements. A number of programs/projects target MS4 management measures - i.e. Cease the Grease, Storm drain stenciling, Trash Bash, pet waste LID/Green Infrastructure. Top 5/Least 5 project and Bayou Preservation Association/City of Houston investigations are example IDDE programs
	WWTF and Sanitary Sewer System Compliance	Maintain Capacity and Integrity of Sanitary Sewer Systems (SSS).	Promote TCEQ programs and efforts to encourage repairs, improvements and replacement of chronically failing SSS. Promote TCEQ's Sanitary Sewer Overflow Initiative (SSOI) that develops compliance agreements with municipalities with sanitary sewer overflows. Use Back the Bay Outreach to support initiatives that address Fats, Oils, Grease and Sanitary Wipes, common causes of SSOs.	Identify Deficient Systems; Host Technical Workshops; Track TMDL I-Plans.	<p>S: Identify and prioritize list of geographies with chronically failing Sanitary Sewer Systems in need of repair, improvement, or replacement.</p> <p>M: Support or host technical workshops (number to be determined) geared toward targeted communities.</p> <p>M: Track number of workshops supported or hosted and number of attendees.</p> <p>L: Track number of Total Maximum Daily Load (TMDL) Implementation Plans initiated or completed in targeted geography.</p> <p>L: Pull Sanitary Sewer Overflow data for targeted geographies to determine whether or not a reduction has occurred.</p>	PS-1, PS-2	Ecosystem and Human Health - WSQ Goal 2 Maintain Capacity and Integrity of Municipal Sanitary Sewer Collection Systems to Eliminate Sewage Bypasses and Unauthorized Overflows Objective A.	WSQ, TCEQ, TMDL I-Plan, H-GAC, GBF	<ul style="list-style-type: none"> The BIG has identified SSOs as a leading contributor of untreated effluent to area waters. The City of Houston has placed resources to address issues of failing systems. TCEQ Region 12 maintains a list of local governments participating in TCEQ's Sanitary Sewer Overflow Initiative (SSOI). GBF's GB Oyster I-Plan is also addressing SSOs.
					<p>S: Identify chronically failing wastewater treatment facilities and create Compliance Toolbox.</p> <p>M: Use Compliance Toolbox to work with chronically failing facilities, communicating through technical workshops and non-regulatory visits (number TBD).</p> <p>L: Pull failure data for identified wastewater treatment facilities to determine Compliance Toolbox success.</p>				
	Improve WWTF Compliance.	Coordinate with TCEQ's Region Twelve and Small Business Administration on opportunities to improve WWTF compliance. Develop and promote through Back the Bay a compliance tool box that could include measures like technical workshops, increased regulatory compliance inspections and no-notice inspections, development of a non-regulatory inspection program, identify funding sources and potential for regionalization of chronically noncompliant WWTFs.	Develop Compliance Tool Box, Communicate Compliance Options to Public and Operators.						

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WSQ FOCUS AREA
Issue Area: Promote Public Health Awareness

PRIORITY ISSUE	ISSUE AREA DESCRIPTION	SPECIFIC OBJECTIVES	ACTION	MEASURE	TARGETED OUTPUTS* (Short, Medium, Long-term)	GALVESTON BAY PLAN AREA	SAP AREA	LEAD IMPLEMENTERS	STATUS (Projects & Accomplishments)
(a)		(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Waterborne Pathogens and Toxins found in Fish Tissue Pose a Human Health Risk due to Contact Recreation Exposure or Fish and Shellfish Consumption.	Public Health Outreach	Improve Seafood Advisory Awareness.	Support effective seafood advisory outreach. Work with PPE and stakeholders on outreach, education, and awareness efforts to assist the public in better evaluating their risk from consuming Galveston Bay fish and/or shellfish.	Develop Outreach Plan.	S: Develop Seafood Advisory Awareness Outreach Plan. Identify specific goals for increasing awareness (goals TBD).	PH-1	Ecosystem and Human Health - Public-Health Protection Goal 3: Reduce human health risk resulting from consumption of seafood contaminated with toxic substances, Objective B.	PPE, WSQ, TDSHS, TCEQ, TPWD, GLO	<ul style="list-style-type: none"> GBF with funding from the EPA, has placed warning signs in places with seafood advisories as part of their Galveston Bay Seafood Advisory Education Campaign. H-GAC has created a seafood advisory pamphlet. Major legacy source identified as a Superfund Site on the San Jacinto River, currently identifying and approving remedial step. EPA is lead agency.
				Target Groups and Individuals.	M: Significant progress on Outreach Plan goals (50% of goals completed).				
				Assess Program.	L: Significant progress on Outreach Plan goals (100% of goals completed).				
		Improve Regional Contact Recreation Risk Awareness.	Work with the Public Participation and Education subcommittee to develop a public risk advisory program based on risks from contact recreation due to waterborne pathogens.	Develop Outreach Plan.	S: Develop Contact Recreation Outreach Plan. Identify specific goals for increasing awareness (goals TBD).	PH-3	Ecosystem and Human Health - Public-Health Protection Goal 1: Minimize risk of waterborne illness resulting from contact recreation, Objective A.	PPE, WSQ, TCEQ, GLO, Local Governments	<ul style="list-style-type: none"> GLO Texas Beach Watch, (https://cgis.glo.texas.gov/Beachwatch/) Harris, Galveston and Brazoria Counties implement the program at selected recreational beaches along the Texas Coast. When Enterococcus levels exceed standards established by the EPA, GLO and local governments issue advisories warning public not to swim in affected waters
				Target Groups and Individuals.	M: Significant progress on Outreach Plan goals (50% of goals completed).				
				Assess Program.	L: Significant progress on Outreach Plan goals (100% of goals completed).				
	Watershed Based Plans	Improve Regional Contact Recreation Safety by Implementing WBPs (i.e. TMDL I-Plans and WPPs).	Support and facilitate development and implementation of WBPs, including TMDL Programs or WPPs, to address bacteria impaired contact recreation waters. Support could be in the form of continuing the stakeholder process or funding specific measures of the I-Plan or WPP.	Number of TMDLs /I-Plans and/or WPPs supported.	S: Support and facilitate the development of one – two Watershed Based Plans.	PH-3	Ecosystem and Human Health - Public-Health Protection Goal 1: Minimize risk of waterborne illness resulting from contact recreation.	WSQ, TCEQ, TSSWCB, TX AGRILIFE, GBF, H-GAC, and Future Watershed Partners	<ul style="list-style-type: none"> WSQ coordinates with the region WBPs. Bacteria Implementation Group Implementation Plan and Dickinson Bayou Implementation Plan are two TMDL I-Plans developed to address bacteria impairments. Several completed WPPs also address bacteria. Jarbo Bayou TMDL is in development.
					M: Support and facilitate the development an additional two Watershed Based Plans (three – four total).				
		Improve Safety of Human Shellfish Consumption from Bay Waters by Implementing WBPs.	Support implementation of the Upper Texas Coast Oyster Waters TMDL I-Plan to address bacteria impaired oyster waters. Support could be in the form of continuing the stakeholder process or funding specific measures of the I-Plan.	Change in shoreline bacteria concentrations.	S: Support implementation of the Upper Texas Coast Oyster Waters TMDL I-Plan and report on status.	PH-2	Ecosystem and Human Health - Public-Health Protection Objective B and Goal 2: Reduce the concentrations of toxins in key species of concern, Objective A.	WSQ, TCEQ, GBF, TDSHS	<ul style="list-style-type: none"> The Upper Texas Oyster Waters TMDL and I-Plan was completed in 2015. TCEQ, Galveston Bay Foundation and stakeholders are implementing the plan to reduce sources of bacteria.
					M: Continue to support implementation of the Upper Texas Coast Oyster Waters TMDL I-Plan and report on status.				
L: Review water quality data to determine whether or not a decrease in bacteria concentrations has occurred.									

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Waterborne Pathogens and Toxins found in Fish Tissue Pose a Human Health Risk due to Contact Recreation Exposure or Fish and Shellfish Consumption. (continued)	Watershed Based Plans (continued)	Improve Safety of Human Consumption of Recreational Finfish by Implementing WBPs.	Support and facilitate development and implementation of legacy and toxin TMDL Programs as they arise. Provide support as needed, for the PCB/Dioxin TMDL study.	Number of TMDLs or I-Plans supported.	S: Support and facilitate the development of one – two Watershed Based Plans.	WSQ-1, WSQ-2, WSQ-3, WSQ-4	Ecosystem and Human Health - Public-Health Protection Objective B and Goal 2: Reduce the concentrations of toxins in key species of concern, Objective A.	WSQ, TCEQ, TSSWCB, TX AGRILIFE, GBF, H-GAC, and Future Watershed Partners	<ul style="list-style-type: none"> Many TMDLs have been developed for local waterways impacted by high concentrations of toxins, including: <ul style="list-style-type: none"> PCB/Dioxin TMDL, Patrick Bayou TMDL, Clear Creek TMDL (TDS-Complete), and Clear Creek Fish Advisory - Chlorinated Pesticides, rescinded. 	
					M: Support and facilitate the development an additional two Watershed Based Plans (three – four total).					
					L: Assess impact of supported Watershed Based Plans by tracking the number of Best Management Plans implemented and number of improved condition Assessment Units.					
Waterborne Pathogens and Toxins found in Fish Tissue Pose a Human Health Risk due to Contact Recreation Exposure or Fish and Shellfish Consumption. (continued)	Public Health Monitoring and Research Priorities	Support a Seafood Consumption Advisory Program.	Continue to support a seafood consumption advisory program in coordination with the Monitoring and Research subcommittee. Conduct fish collection and tissue analysis following established procedures. Complete Health Consultation and Risk Assessment.	Fish Tissue Characterization.	S: Initiate New Study.	PH-1	Ecosystem and Human Health - Public-Health Protection Goal 3: Reduce human health risk resulting from consumption of seafood contaminated with toxic substances, Objective A.	M&R, WSQ, TDSHS, TCEQ, TPWD, GLO	<ul style="list-style-type: none"> ADV-55 was issued in December 2015 and rescinded ADV 49 and the pesticide advisory (HSC) due to lower concentrations but maintains consumption advisory for Dioxin and PCBs in fish and shellfish (all fish and blue crabs) for HSC above Fred Hartman Bridge and an advisory for catfish, spotted seatrout and blue crab between Fred Hartman Bridge south to a line from Red Bluff Point to Five-Mile Cut Marker to Houston Point. ADV 50 issued in June 2013 advisory for all species of catfish for Galveston Bay and all contiguous waters, including Chocolate, East, Trinity, and West Bays. 	
					Completed Studies and Advisory Updates.					M: Complete New Study.
					Evaluate Program and Next Steps.					L: Develop Outreach Recommendations and Plan New Study.
		Characterize Contact Recreation Risks.	Coordinate with the Monitoring and Research subcommittee to sponsor research that will characterize the contact recreation risks from waterborne pathogens.	White Paper Summary and Annotated Bibliography.	S: White Paper.	PH-3	Ecosystem and Human Health - Public-Health Protection Goal 1: Minimize risk of waterborne illness resulting from contact recreation, Objective C.	M&R, WSQ, COH, Harris County, TAMUG, TCEQ	<ul style="list-style-type: none"> City of Houston, Harris County, TAMUG and others have been looking at alternative bacteria indicators, analysis methods, resuspension and other research. 	
				Initiate and Complete Research.	M: Report(s).					
				Apply Lessons Learned, Identify Measures, Determine Appropriate Steps.	L: State of the Bay Report, Presentations, New Research.					

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Waterborne Pathogens and Toxins found in Fish Tissue Pose a Human Health Risk due to Contact Recreation Exposure or Fish and Shellfish Consumption. (continued)	Public Health Monitoring and Research Priorities (continued)	Sediment Legacy Pollutant Characterization Studies.	Conduct aquatic fauna tissue analysis, identify potential legacy pollutant sites, and determine remedial actions, if needed/possible.	White Paper Summary and Annotated Bibliography.	S: White Paper.	PH-1, WSQ-1, WSQ-2, WSQ-3, WSQ-4	Ecosystem and Human Health - Public-Health Protection Goal 2: Reduce the concentrations of toxins in key species of concern, Objective B.	M&R, WSQ, TDSHS, TCEQ, TPWD, GLO	<ul style="list-style-type: none"> Many TMDLs have been developed for local waterways impacted by high concentrations of toxins, i.e. PCB/Dioxin TMDL, Patrick Bayou TMDL, Clear Creek TMDL (TDS-Complete), and Clear Creek Fish Advisory - Chlorinated Pesticides, rescinded. Little is known about the affect on the aquatic food chain with the exception of key species collected by TDSHS for fish consumption advisory studies.
				Initiate and Complete Research.	M: Report(s).				
				Apply Lessons Learned, Identify Measures, Determine Appropriate Steps.	L: State of the Bay Report, Presentations, New Research.				
		Characterize Pollutant Loads From Air Deposition.	Coordinate with the Monitoring and Research subcommittee to characterize pollutant loads from air deposition. Loadings for toxins and other pollutants (nutrients) would be assessed.	White Paper Summary and Annotated Bibliography.	S: White Paper.	WSQ-2	Ecosystem and Human Health - Public-Health Protection Goal 2: Reduce the concentrations of toxins in key species of concern, Objective B.	M&R, WSQ, Local Universities	<ul style="list-style-type: none"> GB Symposium highlighted studies on this topic. GBEP funded a project with the University of Houston in 2005(?).
				Initiate and Complete Research.	M: Report(s).				
				Apply Lessons Learned, Identify Measures, Determine Appropriate Steps.	L: State of the Bay Report, Presentations, New Research.				

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