

Element D- Technical and Financial Assistance

Successful implementation of the Highland Bayou WPP relies on the active participation of local stakeholders, as well as support and assistance from a variety of other sources. The technical expertise, equipment, and staffing required for many priority action areas are beyond the capacity of any one stakeholder alone. Direct support from one or a combination of several sources listed below will be essential to achieve water quality goals in the Highland Bayou Watershed. In Table D-3 below, an estimate of associated costs and potential funding source are listed for each Priority Action Area UID. All priority action areas are dependent upon funding and resources.

Potential Funding Sources

A comprehensive narrative of funding sources is provided in Appendix 5, Funding Sources. Funding sources are grouped by federal and state agencies, listed by program name and include eligibility, criteria, and funding limitations. Tables D-1 and D-2 below list programs discussed in the Appendix 5 narrative.

Electing to pursue a funding source requires a clear understanding of your project scope and requirements and a clear understanding of the sponsor’s funding priorities. The two have to line up for applications to be a success. Many funding sources (but not all) have a lengthy review process and the disbursement of funding may not happen for several fiscal quarters after approval, meaning that it can be over a year between submittal of an application and access to funding. Not all funding sources are grants. Some programs offer low interest loans or technical support. Some grants require a local, non-federal match, which can be a challenge. This is an additional layer to the application that requires match commitments in advance, either in dollars or non-cash contributions such as equipment or staffing.

Education and outreach support programs (a form of technical support) are listed separately in Element E, Education and Outreach, (see Table E-4). Many of these educational programs are specific to Texas issues and are administered by state and regional agencies. Almost half have some presence in the Houston region and are excellent candidate programs for Highland Bayou education objectives.

Table D- 1. Federal funding source for water quality activities; more information for each of the sources is provided in Appendix 5.

Federal Programs	Agency or Organization
Agricultural Water Enhancement Program	NRCS
Coastal and Estuarine Land Conservation Program	NOAA
Community Development Block Grants (CDBG)	US HUD
Conservation Reserve Program	NRCS
Environmental Education Grants	EPA
Environmental Quality Incentive Program	NRCS
Target Watersheds Grant Program	River Network and EPA
WaterSMART: Cooperative Watershed Management Program	US Dept. of the Interior
Water and Environmental Programs	USDA
Wetlands Reserve Program	NRCS

Table D- 2. State funding sources for water quality activities; more information for each of the sources is provided in Appendix 5.

State Programs	Agency or Organization
Beach Maintenance Reimbursement Fund Program	Texas General Land Office (TX GLO)
Boating Access Grants	TPWD
Clear Water State Revolving Fund	Texas Water Development Board (TWDB)
Coastal Impact Assistance Program	TX GLO
Economically Distressed Areas Program	TWDB
Landowner Incentive Program	TPWD
Recreation Grant Program- Boating Access Grant	TPWD
Recreation Grant Program - Boat Sewage Pumpout Grant	TPWD
Reginal Water Supply and Wastewater Facilities Planning Program	TWDB
TCEQ 319 Grant	TSSWCB
Texas Clean River Programs	TCEQ
Texas Coastal Management Program	TX GLO
Texas Farm and Ranch Lands Conservation Program	TPWD

Technical and Financial Resources Required for Priority Action Areas

Table D-3 lists likely costs and technical assistance requirements for each priority action area and its objectives. Required resources are organized by Priority Action Area and its objectives

Table D- 3. Technical and Financial Assistance

Action Area		Objective	Cost (\$)	Technical Assistance
9	Infrastructure Upgrades to the Sanitary Sewer Collection System	To reduce the volume of raw sewage discharging from failing sanitary sewer system infrastructure.		
	9.1 Infrastructure Upgrades to the Sanitary Sewer Collection System	Adopt or update asset management programs to encourage proactive/preventative maintenance activities	No cost	SSS infrastructure design and capacity standards, plan/program writing for specific community
	9.2 Infrastructure Upgrades to the Sanitary Sewer Collection System	Identify areas in the collection system where I/I or aging infrastructure is a problem.	Variable	None
	9.3 Infrastructure Upgrades to the Sanitary Sewer Collection System	Rehabilitate collection system infrastructure	\$140,000 per year for approx. 2-3 lift stations, 900 linear feet of line replacement, and major line repairs	SSS infrastructure design and capacity standards; heavy/excavation equipment, professional planning and labor
	9.4 Infrastructure Upgrades to the Sanitary Sewer Collection System	Upgrade or repair private line connections to the wastewater collection system. Performed as necessary	To refurbish water and sewer lines for 130 houses and convert 2 old lift stations from gravity to	Heavy/excavation equipment, best practices for line maintenance and repairs.

Action Area	Objective	Cost (\$)	Technical Assistance
		forced main: \$500,000. Potential monetary help in the form of CDBG funds; IKE funding	
6	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	To minimize the introduction of SSO raw sewage into local waterways. Reduce the deposition FOG and wipes from entering sewer lines. Encourage proper disposal practices through education and outreach to residents and commercial entities on items that should not enter their drains.	
6.1	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Regulation and Policy for Fats, Oils, and Grease in commercial settings	No cost, Staff time to compile and report, to outreach to city councils
6.1.1	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Compile existing regulations within the watershed and share.	No cost, Staff time to compile and report, to outreach to city councils
6.1.2	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Examine, establish, and/or update regulations as necessary to address gaps.	No cost, Staff time to compile and report, to outreach to city councils
6.1.3	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Include enforcement measures	No cost, Staff time to compile and report, to outreach to city councils
6.1.4	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Perform outreach to promote participation and aid in compliance.	\$5,000-\$10,000 per year for staff support, printing, and limited travel resources
6.2	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Utilize existing educational messaging related to cooking grease –Cease the Grease campaign materials	\$5,000-\$10,000 one time cost to compile, ongoing staff time to follow through with campaign, assuming this ‘piggy backs with other efforts
6.2.1	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Join the Cease the Grease workgroup.	No cost
6.2.2	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Utilize available online social media materials and website content.	No cost
6.3	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Pilot project - establish one Cease the Grease kitchen grease collection station at an apartment complex	\$850/receptacle (collection station). Does not include maintenance costs

Action Area		Objective	Cost (\$)	Technical Assistance
6.4	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Utilize existing educational messaging related to wipes - Patty Potty campaign materials	No cost	None
6.4.1	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Bolster online presence using free Patty Potty materials on social media sites and webpages	No cost, staff time	None
6.4.2	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Join the Patty Potty Patrol for access to videos, inserts, and public service announcements. Save Water Texas Coalition members receive a discount. Project ideas include: showing a Patty Potty video clip on the topic of flushable wipes in movie theatres (as the San Jacinto River Authority currently does); and setting up a standup cardboard cut-out of Patty Potty with a “don’t flush wipes” message in the City Hall lobby	Variable	None
6.5	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Utilize utility bills for distribution of educational material to homeowners	\$0.10/page	None
6.5.1	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Publicize costs for damages to sewer infrastructure to city taxpayers. “Cleaning out wipes that go down the drain is costing tax dollars”. Include a list of annual repairs for pump stations with costs, photos, the dos and don’ts of flushing and drains.	\$0.10/page	None
6.6	Fats, Oils, and Grease and Wipes in the Sanitary Sewer Collection System	Host education and outreach workshops for residents and commercial entities	\$5,000- \$20,000 for staff time and coordination. First time costs likely to be high, as workshop becomes routine, costs expected to fall	Technical presentation at workshop
11	Stream flow within the Highland Bayou Channel	Improve flow conditions within the Highland Bayou channel by improving channel flow and by removing impediments to flow, such as fallen trees and sediment accumulation.		
11.1	Stream flow within the Highland Bayou Channel	Determine causes of flow reduction by requesting a study to identify contributing factors	Potentially zero cost or partial match (65/35) , federal cap at \$5,000,000	Section 205 program authority; USACE provides professional expertise, and technical analysis
11.2	Stream flow within the Highland Bayou Channel	Conduct a sediment source study to find the cause of sediment entering the bayou	Potentially zero cost or partial match (65/35) , federal cap at \$5,000,000	Section 204 program authority; USACE provides professional expertise, and technical analysis
11.3	Stream flow within the Highland Bayou Channel	Selectively remove sediment and clear vegetation from the channel as recommended during assessments performed by the	Potentially zero cost or partial match (65/35) , federal cap at \$10,000,000	Section 204 program authority; USACE provides professional expertise and technical analysis.

Action Area		Objective	Cost (\$)	Technical Assistance
		USACE		
11.4	Stream flow within the Highland Bayou Channel	Selectively remove accumulations of woody debris impeding flow within the channel in residential areas as recommended during assessments performed by the USACE	\$150-\$1,500/tree	Possibly USACE Section 14 program authority; Removal plan, equipment and disposal plan are required
13	Culvert Dam Maintenance in the Highland Bayou Channel	To improve flow within the Highland Bayou channel, via the culvert and investigate maintenance needs for culverts within Jack Brooks Park.		
13.1	Culvert Dam Maintenance in the Highland Bayou Channel	Request information from the USACE about culverts to determine maintenance needs (potential removal of sediment and debris) to improve flow	No cost	None
13.2	Culvert Dam Maintenance in the Highland Bayou Channel	Remove sediment and clear vegetation from culverts	Potentially zero cost or partial match (65/35) , federal cap at \$10,000,000	Heavy equipment to excavate, technical plans to repair culverts if repairs deemed necessary; access to site from County Parks; disposal site for sediment
13.3	Culvert Dam Maintenance in the Highland Bayou Channel	Establish a management/maintenance agreement.	No cost	Coordination between jurisdictional agencies
19	Pet Waste Education	To reduce bacteria loads from pet waste, encourage pet owners to pick up pet waste by providing pet waste stations in public areas, and provide education and outreach to pet owners on proper pet waste management and impact of pet waste on water quality.		
19.1	Pet Waste Education	Distribute pet waste educational material to residents during public events	\$200 per station + \$32 per box of 800 replacement bags annually	None
19.2	Pet Waste Education	Install pet waste stations with bag dispensers in parks and other public spaces	Total of \$360 for the installment and bag replacement for each station.	Waste collection agreement/maintenance schedule
19.3	Pet Waste Education	Distribute pet waste bag dispensers to residents during public events	\$1,000 for materials biannually	None
24	Green Infrastructure and Stormwater Treatment Wetlands	To reduce the amount of stormwater runoff entering local waterways by retaining rainfall on site or in neighborhood and regional detention features and to treat stormwater runoff using GI and SWW.		
24.1	Green Infrastructure and Stormwater Treatment Wetlands	Update development codes to allow for GI projects during new development and stormwater retrofits; example ordinances are available for reference	No cost	Technical expertise in design and siting standards for inclusion in drafting of ordinances and practices to match local conditions/resources
24.2	Green Infrastructure and Stormwater Treatment Wetlands	GI for public buildings and in public spaces	\$2,000 - \$100,000 per site, for design-construction. Projects range from minor installations to multi-acre projects. The cost depends on the goals for the property and the projects. Labor costs can be offset with volunteer efforts.	Heavy/Excavation equipment, vegetation, technical designs, acquisition costs, volunteer management

Action Area		Objective	Cost (\$)	Technical Assistance
24.2.1	Green Infrastructure and Stormwater Treatment Wetlands	Identify public entities interested in utilizing GI	None	None
24.2.2	Green Infrastructure and Stormwater Treatment Wetlands	Design and implement GI projects including rain gardens, permeable pavement, bio-swales, vegetated curb extensions, rain water harvesting cisterns and WaterSmart landscaping	\$2,000 - \$100,000 per site, for design-construction. Projects range from minor installations to multi-acre projects. The cost depends on the goals for the property and the projects. Labor costs can be offset with volunteer efforts.	Heavy/Excavation equipment, vegetation, technical designs, acquisition costs, volunteer management
24.3	Green Infrastructure and Stormwater Treatment Wetlands	Educate residents as well as public entities about GI	\$1,000 for materials biannually, Total of \$2,000/year	Layout, design, & printing
24.3.1	Green Infrastructure and Stormwater Treatment Wetlands	Distribute educational materials about GI practices, how they can be used locally, and their impact on water quality	\$1,000 for materials biannually, Total of \$2,000/year	None
24.3.2	Green Infrastructure and Stormwater Treatment Wetlands	Partner with AgriLife to host GI workshops, lectures and field trips to educate homeowners, businesses and municipal officials	\$20,000	None
24.3.3	Green Infrastructure and Stormwater Treatment Wetlands	Partner with GBF to host rain barrel workshops for residents to promote water conservation	No fee to request workshops. Participants pay a \$35 registration fee. Sponsors can purchase kits for a raffle to encourage attendance.	None
24.4	Green Infrastructure and Stormwater Treatment Wetlands	Encourage the use of constructed stormwater treatment wetlands	\$2,000-\$10,000 staff time to compile outreach materials and to network/outreach	Design standards, GI practices, Specialized outreach to targeted entities
24.4.1	Green Infrastructure and Stormwater Treatment Wetlands	Host constructed stormwater wetlands workshops for public entities and developers	\$20,000 from scratch for staff and resources, costs could be half or less if presentations are packaged and if outreach is streamlined.	Technical presentation at workshop
24.4.2	Green Infrastructure and Stormwater Treatment Wetlands	Identify public entities interested in utilizing stormwater treatment wetlands and establish ordinances to consider these practices	No cost	Specialized outreach to targeted entities
24.4.3	Green Infrastructure and Stormwater Treatment Wetlands	Retrofit existing stormwater detention facilities into stormwater treatment wetlands where feasible	\$100,000+	Heavy/Excavation equipment, design-construction plans, labor, property acquisition or easements, permitting
24.4.4	Green Infrastructure and Stormwater Treatment Wetlands	Incorporate stormwater treatment wetlands during new development projects	\$1,000-\$15,000, cost varies by practice and design, primarily capacity volume, See Appendix 4 for average costs for specific practices by unit	Heavy/Excavation equipment, design-construction plans, labor, property acquisition or easements, permitting
30	Stormwater Infrastructure Assessment Surveys	To assess stormwater drainage system infrastructure to improve system management and identify maintenance needs and opportunities for where water quality practices could be implemented.		

Action Area		Objective	Cost (\$)	Technical Assistance
30.1	Stormwater Infrastructure Assessment Surveys	Compile and review previous storm drainage system studies to determine the scope needed for an updated assessment	No cost	Municipalities; MUDs; County agencies; Drainage districts; AgriLife; Resource agencies/organizations
30.2	Stormwater Infrastructure Assessment Surveys	Inventory stormwater infrastructure components	\$60,000	GIS, field surveys, infrastructure and design standards
30.2.1	Stormwater Infrastructure Assessment Surveys	Establish data objectives, requirements, and the data collection schedule	Part of above cost, 30.2	GIS, infrastructure and design standards
30.2.2	Stormwater Infrastructure Assessment Surveys	Inventory and map public stormwater system	Part of above cost, 30.2	Field survey and staff, knowledge of infrastructure and design standards
30.2.3	Stormwater Infrastructure Assessment Surveys	Include a plan to maintain data and update inventory as required	Uncertain	GIS, infrastructure and design standards
30.3	Stormwater Infrastructure Assessment Surveys	Characterize stormwater system components in the inventory to prioritize improvement needs and pollution prevention measures	Part of above cost, 30.2	Field survey and staff, knowledge of infrastructure and design standards
23	Landscaping and Landscaping Debris Ordinances	To decrease and minimize the introduction of lawn debris and nutrients into stormwater.		
23.1	Landscaping and Landscaping Debris Ordinances	Develop new or strengthen existing ordinances addressing lawn clipping and landscaping debris management. Example ordinances are widely available for reference	No cost	Knowledge of landscaping standards, knowledge of drafting ordinances and compliance
23.2	Landscaping and Landscaping Debris Ordinances	Communicate landscaping ordinance requirements or landscaping best practices to residents and landscaping contractors.	\$1,000 for materials biannually, Total of \$2,000/year	None
23.3	Landscaping and Landscaping Debris Ordinances	Develop enforcement measures for the ordinance including penalties due following multiple offenses.	No cost	Knowledge of landscaping standards, knowledge of drafting ordinances and compliance
23.4	Landscaping and Landscaping Debris Ordinances	Publicize contact information for reporting violations or poor disposal practices.	\$1,000 for materials biannually, Total of \$2,000/year	None
37	Landowner Conservation Plans	To increase landowner participation in existing conservation and habitat management plans to decrease bacteria and nutrient loading and enhance water quality within the watershed.		
37.1	Landowner Conservation Plans	Identify existing conservation and habitat management plans within the watershed	No cost	None
37.2	Landowner Conservation Plans	Identify interested landowners to participate in conservation and habitat management plans. Facilitate communication between organizations with existing voluntary programs with potential participants when appropriate	No cost	Technical knowledge of plan requirements and management practices and standards
37.2.1	Landowner Conservation Plans	Host landowner workshops addressing land management practices	2 public workshops on land conservation- \$50,000; initial costs are high and could be shared	Technical presentation

Action Area		Objective	Cost (\$)	Technical Assistance
			across multiple watershed	
37.2.2	Landowner Conservation Plans	Distribute educational materials to landowners regarding land stewardship practices.	\$1,000 for materials biannually, Total of \$2,000/year	None
37.2.3	Landowner Conservation Plans	Develop and implement individual NRCS conservation plans, WQMPs, and LIP participation	Variable	None
34	Preserve Existing Natural Areas	To preserve priority undeveloped lands in their natural state and protect the water quality benefits of undeveloped land and improve land management practices of undeveloped areas by providing education on habitat value for wildlife and water quality.		
34.1	Preserve Existing Natural Areas	Support acquisition of undeveloped natural lands for conservation	Cost varies, expected to be a 6-7 dollar figure acquisition, depending on size of property, assuming large properties with meaningful conservation value. Acquisition costs in addition to property costs	Legal assistance with title search, acquisition, use restrictions, and easements; technical assistance with habitat and water quality merits of the property; Knowledge of funding sources, grant writing, and grant management.
34.1.1	Preserve Existing Natural Areas	Review area conservation plans and consult with resource and conservation organizations to identify protected lands within the watershed	No cost	Technical knowledge of land management practices and their application
34.1.2	Preserve Existing Natural Areas	Identify and prioritize properties with the potential for conservation management	No cost	Technical assistance with habitat and water quality merits of the property
34.1.3	Preserve Existing Natural Areas	Acquire undeveloped natural lands and encourage conservation easements	Cost varies, expected to be a 6-7 dollar figure acquisition, depending on size of property, assuming large properties with meaningful conservation value. Acquisition costs in addition to property costs	Legal assistance with title search, acquisition, use restrictions, and easements; technical assistance with habitat and water quality merits of the property; Technical knowledge of land management practices and their application; Knowledge of funding sources and grant writing, and grant management
34.2	Preserve Existing Natural Areas	Provide education for public entities and residents on loss of habitat for wildlife utilizing Back the Bay materials and other existing programs	Variable	None
34.3	Preserve Existing Natural Areas	Use regulatory techniques to preserve natural lands	No cost	Technical knowledge of standards for effective ordinance drafting
34.3.1	Preserve Existing Natural Areas	Require inquiry through the USACE for Section 404 mitigation needs during the building permit process	No cost	Technical knowledge of standards for effective ordinance drafting
34.3.2	Preserve Existing Natural Areas	Enact ordinances to protect certain trees from removal or discourage developers from cutting down all trees prior to construction	No cost	Technical knowledge of standards for effective ordinance drafting