

Armand Bayou Above Tidal Comprehensive RUAA

Armand Bayou Implementation Plan Meeting – 8-13-13
Based in part on Material Presented at TCEQ Public Meeting
Originally held on 8/31/2010
UHCL Campus, Houston, TX.



Armand Bayou Above Tidal (Segment 1113A) Comprehensive RUAA

9/24/2010

Comprehensive Recreational Use Attainability Analysis of Armand Bayou Above Tidal Segment 1113A

Contract No. 582-8-80188

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PREPARED IN COOPERATION WITH THE
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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ARMAND BAYOU ABOVE TIDAL

- San Jacinto-Brazos Coastal Basin
- Unclassified water body
- Above Tidal Segment (1113A)
- Impaired water quality based on standard for contact recreation
 - *E. coli* bacteria
- Assess the level of recreational use in the segment



RUAA Procedures

- Recreational Use Attainability Analysis
 - Identify and assign attainable uses and criteria to water bodies
- (2000 TSWQS) 2 use categories
 - Contact
 - Non-Contact
- Recent revisions include subcategories:
 - Primary Contact
 - Secondary Contact 1
 - Secondary Contact 2
 - Non-Contact



Types of RUAA

- Basic RUAA
 - Stakeholder Participation
 - Field Survey

- Comprehensive RUAA
 - Basic RUAA
 - Historical Review
 - Interviews



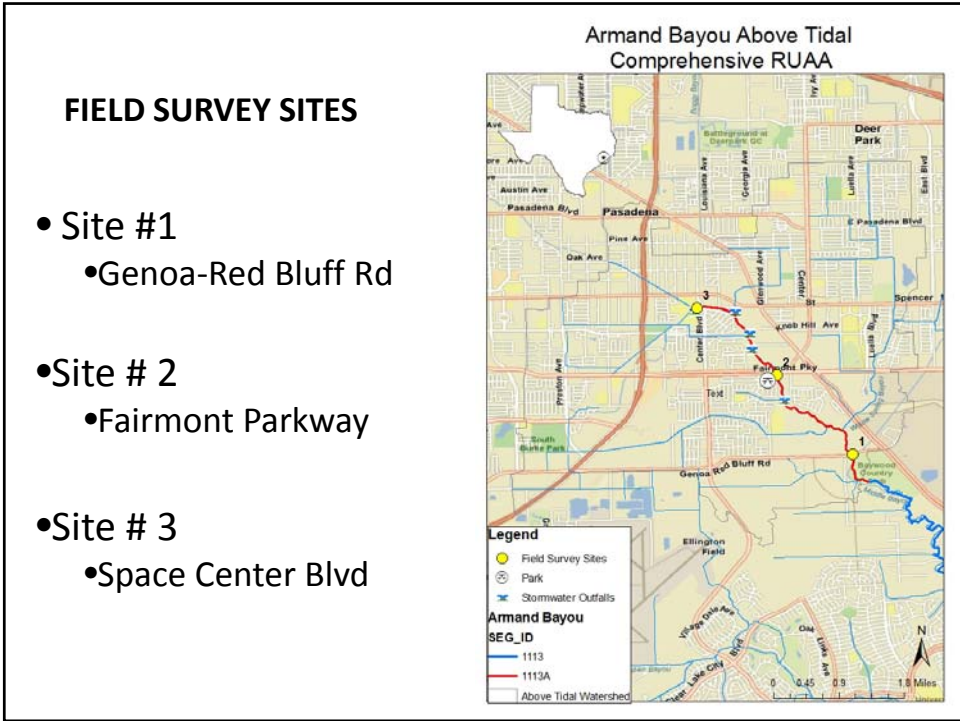
Field Surveys

- Survey Sampling Requirements
 - Normal Warm Season
 - $\geq 70^\circ$
 - generally March-October
 - Base Flow Conditions
 - When most likely observe use

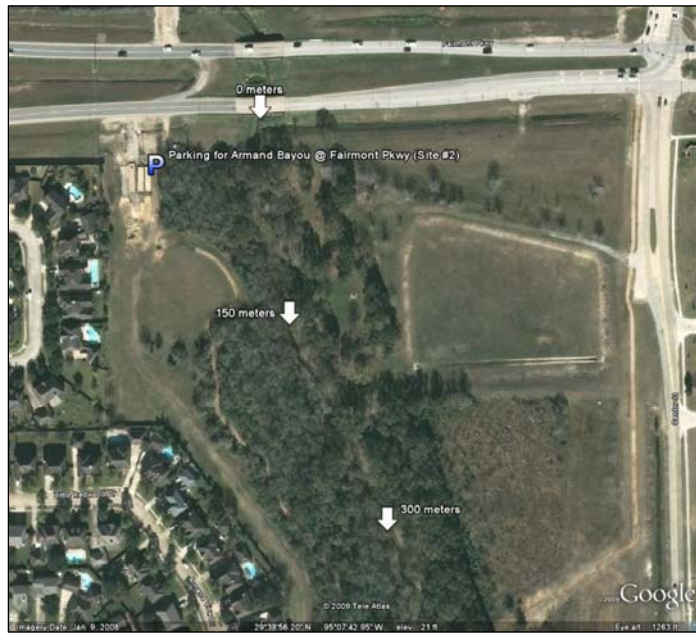
- Site Selection
 - Accessibility to the public
 - Generally 3 sites every 5 miles of stream

- Sampling Procedures
 - Mark sample reach (300m)
 - Flow measurement
 - Depth and width measurements
 - Photographic record
 - Record recreational use observations

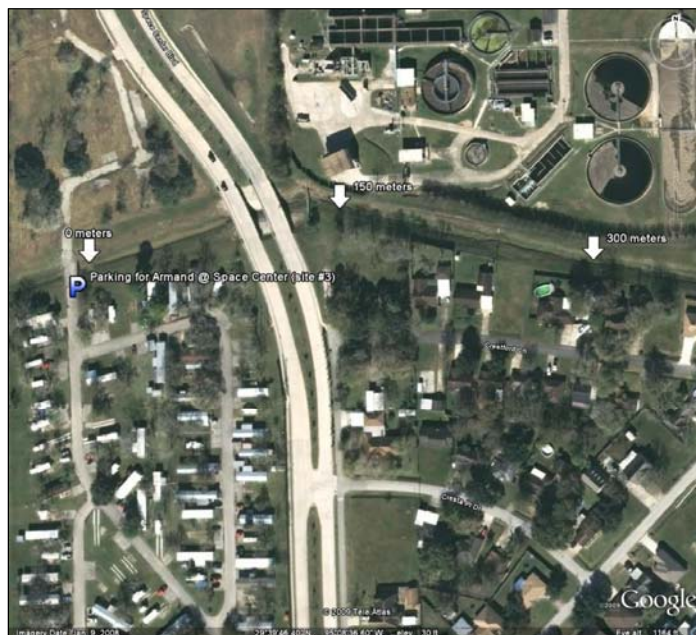




Site # 2: Fairmont Pkwy @ Armand Bayou



Site # 3: Space Center Blvd @ Armand Bayou



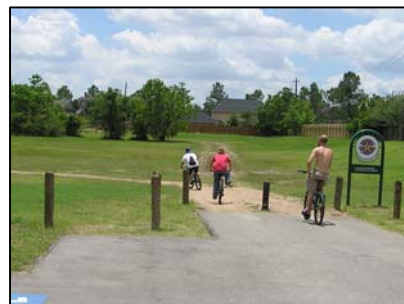
Armand Bayou Above Tidal Physical Parameters

- 5.9 Miles
- 3 Sites
- Substrate: Mud/Clay
- Perennial



Site	Average		
	Flow (cfs)	Width (m)	Depth (m)
1	22.49	6.3	1.1
2	16.03	3.8	0.5
3	2.40	3.8	0.8

Recreational Uses Observed



Interview Summary

- Total number of attempted interviews: 111
 - Willing to Respond: 64
 - 57 by phone
 - 3 by mail
 - 4 in person
- Are you familiar with Armand Bayou Above Tidal?
 - Yes 46
 - No 18
- Have you or your family used the stream for recreation?
 - Yes 14
 - No 32
- Have you ever observed recreation on Armand Bayou Above Tidal?
 - Yes 26
 - No 20
- Have you ever heard about recreation on Armand Bayou Above Tidal?
 - Yes 21
 - No 25

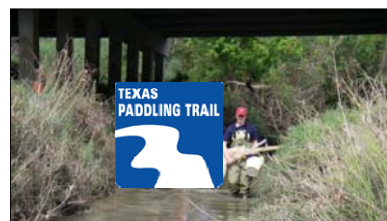
Armand Bayou Above Tidal Comprehensive RUAA						
Types of Recreation	Field Survey	Interviews			Total	
	Observations	Personal Use	Witnessed	Hearsay		
1°	Swimming					
	Snorkeling					
	Water skiing					
	Wading -Children			1	1	2
2°	Wading -Adults		1	2	1	4
	Rafting					
	Tubing					
	Jet Skiing					
	Boating			2		2
	Kayaking		4	11	8	23
	Canoeing		8	9	8	25
	Tubing					
non	Fishing	2	4	13	5	24
	Hunting				1	1
	Trapping					
	Walking/Hiking	4	4	9	2	19
	Jogging/Running	1				1
	Bicycling	1	1	2	1	5
	Camping					
	Motorcycle/ATV			1		1
Wildlife watching		3	3	1	7	

Evidence of Recreational Use



Other Documented Uses

- Class Field Trips
- Potential access via the Texas Paddling Trail



Conditions that Impede Recreational Use

- Steep Banks
- Heavy Vegetation
- Murky Water
- Channel Obstructions
- Public Access
- Wildlife
- Private Property
- Fences
- Depth



Recreational Uses Key

-  Swimming
-  Wading-Children
-  Wading-Adult
-  Rope Swing
-  Kayak/Canoe
-  Boating
-  Fishing
-  Walking
-  Hunting
-  Bicycling
-  ATV/Motorcycle
-  Wildlife Watching

Armand Bayou Above Tidal Comprehensive RUAA



Conclusion

- UHCL/EIH Submitted final Comprehensive RUAA report to TCEQ
- Findings and Public Comment reviewed by Standards Division at TCEQ
- Recreational Use confirmed, recreational *E. coli* criteria apply.

Armand Bayou Watershed: A TMDL Project to Protect Recreational Uses

A current project to reduce bacteria levels and protect recreational safety in the waters of Armand Bayou. The stakeholders and TCEQ are developing total maximum daily loads (TMDLs) and an implementation plan (I-Plan), which together will provide the road map for improving water quality.

[Back to TMDL Projects](#)

County: Harris

Parameter: Bacteria

River Basin: San Jacinto-Brazos Coastal

Segments: 1113, 1113A, 1113B, 1113C, 1113D , 1113E

- [Project Overview \(PDF\)](#)

- [Background and Goals](#)

-  [Get Involved](#)

- [For More Information](#)



Armand Bayou
Above Tidal

<http://www.tceq.texas.gov/waterquality/tmdl/89-armandbacteria.html>

ARMAND BAYOU TMDL AND I-PLAN

Armand Bayou is a tributary of Clear Lake, located in the San Jacinto-Brazos Coastal Basin. High concentrations of bacteria, which are found in both human and animal waste, have sometimes been observed in the bayou. The presence of these bacteria may indicate a health risk to people who swim or wade in the bayou—activities referred to as “contact recreation” in the Texas Surface Water Quality Standards.

The goal of this project is to improve water quality in order to protect people who swim in the bayou. Toward that goal, the TCEQ is developing total maximum daily loads (TMDLs) and an implementation plan (I-Plan) to reduce bacteria in Armand Bayou and several of its tributaries. Before beginning TMDL development, the TCEQ evaluated recreational uses and standards for Armand Bayou Above Tidal, Segment 1113A.

County: Harris

Parameter: Bacteria

River Basin: San Jacinto-Brazos Coastal

Segments: 1113, 1113A, 1113B, 1113C, 1113D, 1113E

First Meeting:

When: Thursday, February 21, 1:30 p.m. to 3:30 p.m.

Where: Environmental Institute of Houston

N.O.A. Building at the University of Houston Clear Lake

2700 Bay Area Blvd

Houston, TX 77058

281-283-3950 (EIH Office)

<http://www.h-gac.com/community/water/tmdl/armand-bayou/default.aspx>

****Commentary & Technical issues - RUAA***

- Ability to detect recreational use dependent on:
 - Frequency of monitoring - effort
 - Magnitude of use – “detection” - # of users/event
 - use – frequency - # events/year
 - Terrain – ability to see recreation
- Cultural & Socioeconomic Factors
- Age specific behavior
- Exposure Assumptions – e.g. kayaking

* Reflections of author, not necessarily shared by sponsoring agency





Seasonality?



