

**OIL SPILL CONTINGENCY PLAN
FOR
ARMAND BAYOU NATURE CENTER AND
COASTAL PRESERVE
HARRIS COUNTY, TEXAS**

By
Jeffrey Davis
Senior Response Officer

Texas General Land Office Oil Spill
Prevention and Response Program
La Porte, Texas
May 2018

Oil Spill Contingency Plan

Table of Contents

- 1.0 Intent**
- 2.0 Background**
- 3.0 Description of Armand and Horsepen Bayous**
- 4.0 Response Plan**
 - 4.1 Initial Discovery**
 - 4.2 Person in Charge**
 - 4.3 Notifications**
 - 4.4 Chain of Command**
 - 4.5 Initial Assessment**
 - 4.6 Pre-Planned Boom Deployment for Discharge Scenarios**
 - 4.7 Priority Issues**
- 5.0 Special Response Considerations**
- 6.0 Appendices**
 - 6.1 Appendix I- Map of Armand Bayou with Key Pipeline and Road Crossings**
 - 6.2 Appendix II-Initial Notification Flowchart for ABNC Personnel**
 - 6.3 Appendix III- Notification Quick Reference Guide**

1.0 Intent

This plan is intended to serve as a first responder guide to an emergency oil spill response event should such a spill threaten the Armand Bayou Coastal Preserve. Areas beyond the boundaries of the preserve are included in the plan. The primary goal in an emergency response will be to protect the health and safety of responders and the public while trying to minimize impacts on coastal resources. This plan focuses on some key containment/exclusion areas to focus on during the initial hours of the spill. Obviously, efforts should be made to contain the spill as close to the source or heaviest concentration as possible.

This plan primarily pertains to spills of petroleum products. Because of the threat to human health involved in responding to hazardous substance spills, only trained personnel will handle such spills. Initial oil spill response measures are critical due to the proximity of residential areas to the bayou, the considerable recreational use of the bayou/neighborhood park areas, and the amount of sensitive habitat and wildlife abundance within the Armand Bayou system.

2.0 Background

Armand Bayou is the largest urban wilderness preserve in the United States, encompassing approximately 2,500 acres. The Armand Bayou Nature Center (ABNC) was created in 1974 and continues to operate as a non-profit organization dedicated to preserving natural habitats and allowing the public to experience these disappearing habitats.

In the early 1990's, the Texas General Land Office (TGLO) in coordination with the U. S. Environmental Protection Agency (EPA) leased 300 acres of submerged state lands of Armand Bayou to the Texas Parks and Wildlife Department (TPWD), thus creating the Armand Bayou Coastal Preserve. The ABNC plays a key role in managing the coastal preserve for TPWD. The coastal preserve roughly extends approximately 0.6 miles upstream of Bay Area Blvd, extends downstream to the powerline crossing over Lake Pasadena (aka Mud Lake), and extends into Horsepen Bayou to near the Middlebrook Dr. bridge.

Harris County Parks Department Precinct 2 maintains a very popular park (Bay Area Park) that is on Armand Bayou adjacent to the ABNC. The park has many amenities that include a small boat ramp for launching canoes/kayaks, a floating fishing dock and marsh boardwalks with covered T-heads. Bay Area Boulevard also crosses Armand Bayou on the north side of Bay Area Park and the ABNC.

The management plan created by TPWD and EPA states that plans for protection during an acute pollution event should be coordinated with TGLO and Texas Commission on Environmental Quality (TCEQ). The plan will focus on protecting areas of critical habitat within and along the Armand Bayou Coastal Preserve and portions of the bayou and tributaries that lie both upstream and downstream of the preserve itself. Along with significant areas of natural occurring coastal

marsh (both brackish and freshwater), there have been many areas of habitat restoration and marsh plantings conducted by ABNC and Harris County.

3.0 Description of Armand and Horsepen Bayous

Armand Bayou begins as a narrow, channelized ditch in Pasadena. The bayou becomes tidally influenced at the Genoa-Red Bluff bridge crossing. About a mile south of the Genoa-Red Bluff bridge the bayou begins to look more naturalized with many overhanging trees and some small log jams. The first two pipeline corridors cross this upper section of Armand Bayou. One of these pipeline corridors contains a 30" crude oil line. Just upstream of the confluence of Spring Gully, begins the first of many shallow embayments that occur along the remainder of the bayou. The bayou begins to slowly widen and the embayments become larger and more heavily vegetated as it meanders south through an old oil field. The main channel is about 8-10 feet in depth, with an occasional tree stump or submerged limb particularly along the edge of the channel. As the bayou joins with the channelized flow of Big Island Slough from the northeast, the embayments grow in size and are very heavily fringed with vegetation. Unless there has been a recent rain event, the bayou has very little flow, typically only slight tidal movement.

Just downstream of the Bay Area Boulevard bridge begins Bay Area Park. A very large pipeline corridor crosses under the bayou and through the middle of the park. There is an 8" and 16" crude oil line and a 6" kerosene/diesel/gasoline line within this corridor. The bayou channel is much less defined and not nearly as deep. Just downstream of the park property is the ABNC. Just downstream of the ABNC wooden boathouse, Armand Bayou merges with Horsepen Bayou which flows in from the west. The bayou becomes wide and shallow as it flows down and empties into Lake Pasadena (aka Mud Lake). There are waterfront residential areas on both sides of Lake Pasadena, as well as another very popular Harris County park (Clear Lake Park) near the NASA Parkway bridge.

Horsepen Bayou is a major tributary of Armand Bayou. Like Armand Bayou, Horsepen Bayou begins as a channelized ditch that originates near the south end of Ellington Field and flows generally east through the Clear Lake City area of Houston. There are numerous road crossings over Horsepen Bayou. Horsepen Bayou is channelized from its headwaters down through the University of Houston-Clear Lake campus. Within the UHCL campus, the same large pipeline corridor that crosses under Armand Bayou and Bay Area Park crosses Horsepen Bayou. As Horsepen approaches the confluence with Armand Bayou, the channel begins to meander and become braided. There are several shallow embayments that are heavily vegetated.

The Armand Bayou System is a relatively shallow estuarine system. During high tides, water depth can reach 2-3' in the flats/embayments and 8-10' in the natural deep-water channel. During low tides, there can be extensive areas of exposed mud flats with 5-7' water in the natural channel. These conditions require either an airboat or small john boat for operational functions. Good access points are limited due to the undeveloped nature of the bayou. Access points to be considered include the pipeline corridors themselves, bridge crossings, Bay Area Park, and Clear Lake Park. Due to the urban environment, there are no difficulties foreseen with communication.

The property encompassed by the preserve was once owned by an oil company and much of the uplands north of Bay Area Boulevard are still owned by ExxonMobil. Due to the bayou's proximity to the Bayport Industrial Complex and the fact that it lies between the Houston Ship Channel and Texas City petrochemical complexes means that there are several pipeline corridors that cross Armand Bayou and its tributaries. In a nutshell, there are several locations in which a pipeline spill could easily reach the bayou. Additionally, a spill could come from Clear Lake to the south or from any of several roadways that directly cross Armand Bayou or its tributaries.

4.0 Response Plan

4.1 Initial Discovery

- Identify the source (safely)
- Notify the person in charge of ABNC
- Notify other employees of the incident, evacuate, if necessary
- Initiate emergency medical services, if necessary
- Remove all ignition sources, if can be done safely
- Secure the scene/evacuate nature center and county park

4.2 Person in Charge

- Ensure all personnel are accounted for
- Make notifications to the State of Texas Spill Reporting Hotline and National Response Center
- Notify outside agencies and organizations and potential pollution owners
- Notify ABNC Board of Trustees
- Ensure all safety procedures are followed until emergency responders arrive
- Assess character, source, amount, and extent of spill, if can be done safely

4.3 Notifications

An employee who discovers a spill should immediately notify the person in charge (see **6.2 Appendix II**). All federal, state and local notification numbers are listed in **6.3 Appendix III**.

4.4 Chain of Command

A Unified Command System will be established with the TGLO, USCG and Responsible Party (RP) in the event of an oil spill as per the Area Contingency Plan (ACP). The person in charge at ABNC should be prepared to brief incident command once on-site. Information should include:

- Where and when was the spill found?

- Who spotted it?
- About how big an area does it cover?
- What areas/wildlife are impacted?
- What has been done thus far?

4.5 Initial Assessment

Upon discovery of a discharge in Armand Bayou, the person in charge will take all actions necessary to ensure personal and personnel safety. If appropriate, the person in charge should ensure that Nature Center personnel and visitors leave the area immediately and muster at the ABNC visitors center. Person in charge should wait for emergency responders for further instruction.

Once on scene, emergency responders should take actions to control the source and prevent further discharges, assess the situation and, based on the information gathered, initiate an appropriate response in accordance with the ACP. The responders should follow National Incident Management System (NIMS) protocol for command structure and incident documentation.

4.6 Pre-Planned Boom Deployment for Discharge Scenarios

The most likely sources of a major spill would be from a pipeline leak at or very near a bayou crossing or a spill from another source such as a tanker truck that occurs at or near one of the bridge crossings over the bayou or its tributaries. Along much of Armand and Horsepen Bayous (beyond the boundaries of the coastal preserve) there are areas of important marsh areas to protect as there have been numerous marsh creation sites over the years, but in particular there are two areas in which protection warrants high priority if threatened by a spill due to extensive habitat restoration efforts conducted at those sites over the years. Those sites include the mouth of Horsepen Bayou (Site 65-H) and a 6-acre restoration site on Armand Bayou (Site 65-I).

The vast majority of the shoreline of the Armand Bayou Coastal Preserve is vegetated, therefore, there are any number of booming strategies that can be utilized to contain a spill or protect specific areas of concern. Incident Command should be very adaptable in terms of responses within the preserve. A crude oil pipeline spill from the upper portion of Armand Bayou near Genoa-Red Bluff road during a rain event has different protection priorities than a large diesel spill from a tank truck collision on the NASA Parkway bridge with a flood tide and strong southeast wind.

The Site Specific Response Sheet for this area is League City and may be accessed via the GLO Oil Spill Toolkit which can be found on the TGLO website. www.glo.texas.gov

4.7 Priority Issues

1. Keep oil out of the marsh areas.
2. Keep oil off the Bay Area Park and Baronridge Park shorelines.

3. Keep birds and wildlife out of oiled areas.

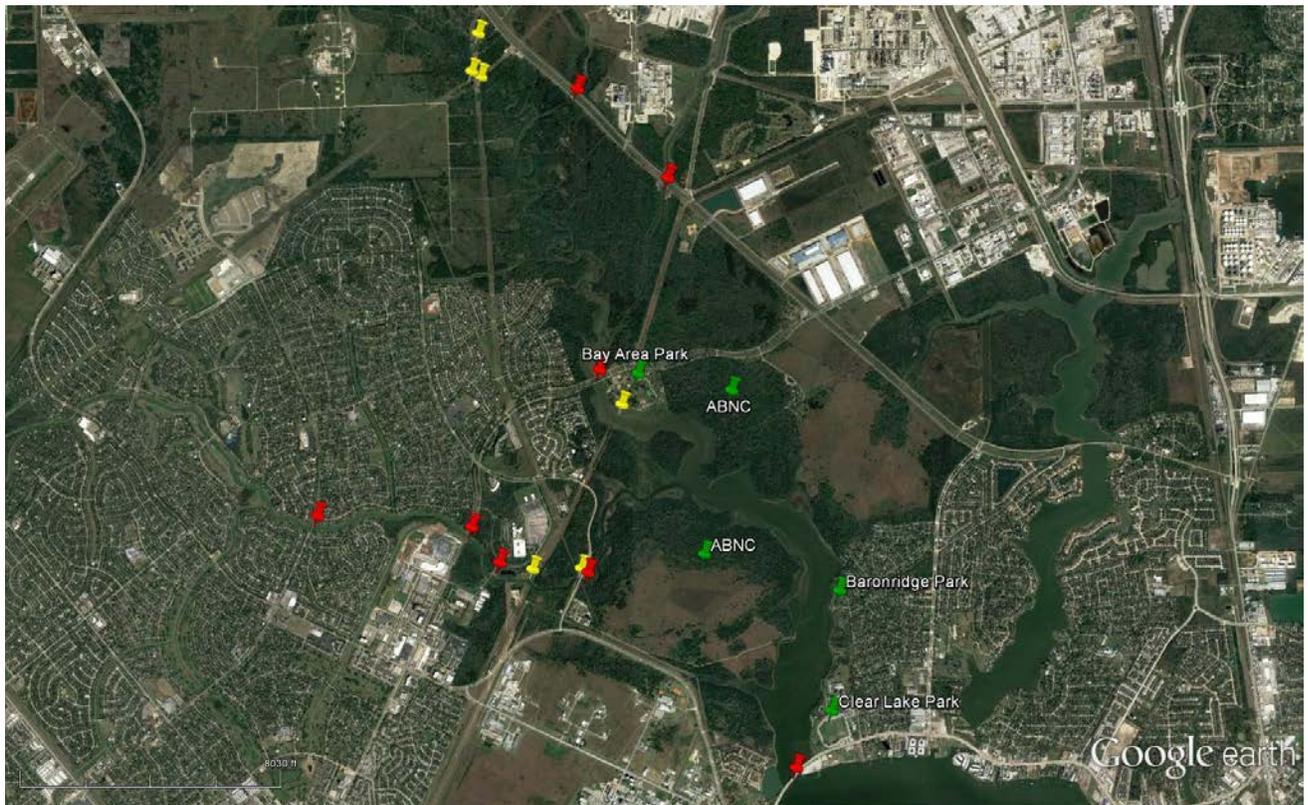
5.0 Special Response Considerations

- Gasoline engines are only allowed in the coastal preserve for emergency response.
- Several bridge crossings do not have enough clearance for airboats. Approximate bridge clearances at mean high water (MHW): NASA Parkway 9-10', Bay Area Blvd 7-8', Middlebrook Dr. 10', University Dr. in UHCL 10-11'.
- Low hanging branches or downed trees may further restrict boat access particularly to the extreme upper reaches of Horsepen and Armand Bayous.
- Erosion and historical subsidence have left many tree stumps in areas outside of the main channel and in areas where the bayou becomes much wider (such as downstream of the Bay Area Blvd. bridge). The numerous stumps could make boom deployment and boat navigation more difficult, especially at lower tide levels.
- The area is relatively natural and as such poses safety threats to responders. Snakes, alligators, mosquitoes and other environmental threats need to be taken into consideration during a spill event.
- Incident Command should assume that media interest will be extremely high and that there will be a significant number of volunteers who will want to assist.
- Local knowledge on the water would be of importance as the natural channel meanders throughout the bayou and is not marked.
- Portions of the bayou can become clogged with water hyacinth (a free-floating nonnative plant) especially during the summer/fall and after rain events. Rafts of water hyacinth will make boom deployment and navigation, even by airboat, extremely difficult. However, rafts of water hyacinth rafts may help to contain a spill.
- Considerable care will need to be given to avoid additional impacts by responders tasked with clean up within the bayou. Passive cleanup techniques may be the best option in vegetated areas.
- Boat access can be challenging. The closest large boat ramp is Clear Lake Park at the NASA Parkway bridge. There is a small paved ramp in Bay Area Park primarily for canoes and kayaks, but it is very shallow. Pipeline corridors may be good points of access for launching airboats or small john boats and deploying equipment.
- In some areas in which the bayou is relatively narrow and there is access to both banks, a small line can be thrown across the bayou and boom deployed by hand.

- As a part of their spill response plan, ExxonMobil Pipeline Co. maintains a Conex box with boom and spill response equipment in the pipeline corridor just across the bayou and south of Bay Area Park.
- During periods of heavy runoff, especially in Horsepen Bayou and the upper portion of Armand Bayou, strong water flow will make navigation and spill containment difficult.
- There is a very high likelihood that wildlife will be oiled.

6.0 Appendices

6.1 Appendix I-Map of Armand Bayou with Key Pipeline and Road Crossings

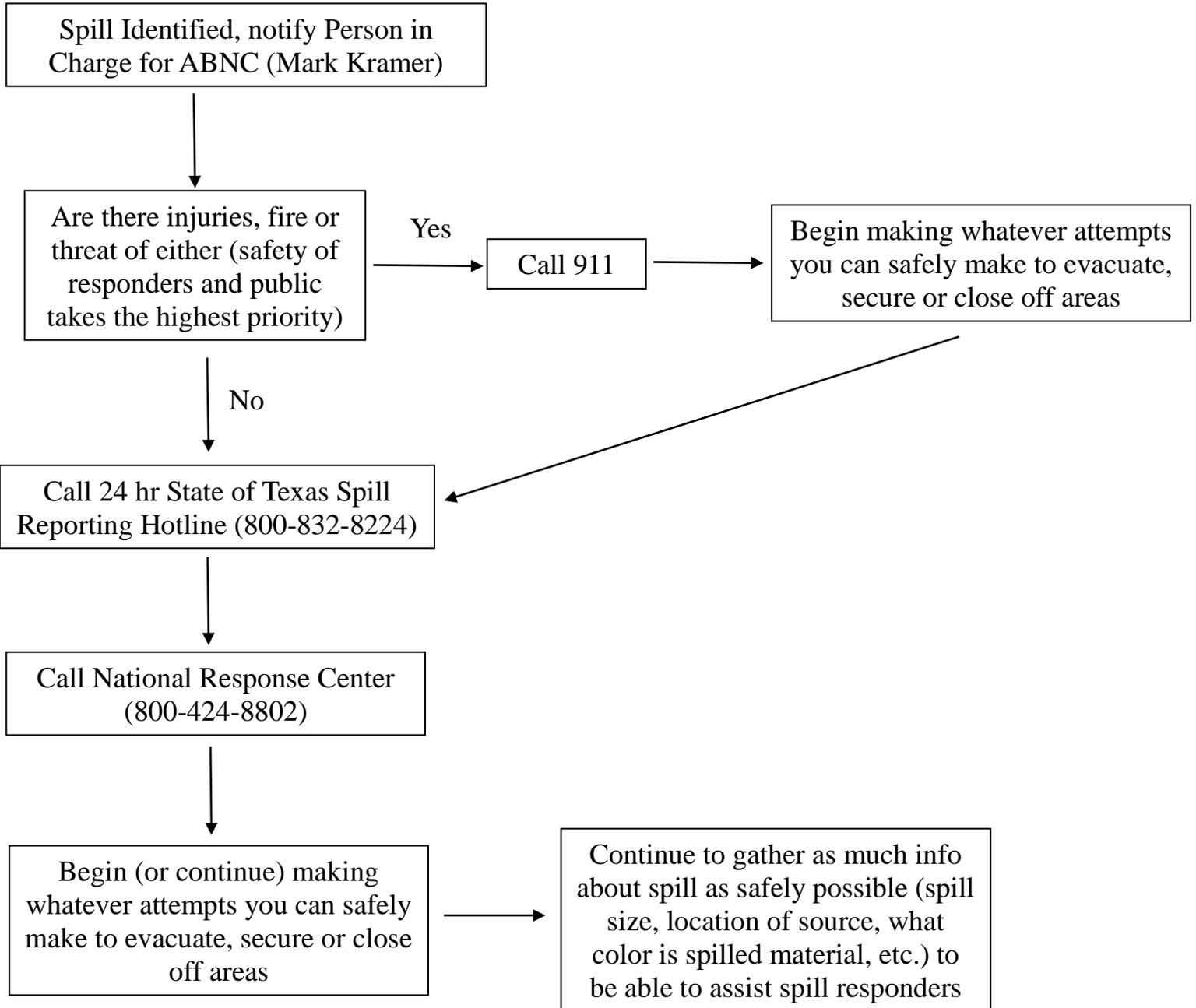


Yellow push pin = pipeline corridor with at least one oil carrying pipeline

Red push pin = road crossing over Armand Bayou or a tributary of Armand Bayou

Green push pin = park land

6.2 Appendix II- Initial Notification Flowchart for ABNC Personnel



6.3 Appendix III- Notification Quick Reference Guide

Internal Notification

- Mark Kramer (Person in Charge for ABNC) office - **713-274-2672**
Cell - **713-591-2596**
- Tom Kartrude (Executive Director ABNC) office - **713-274-2666**

Federal Agency Notification

- National Response Center – **800-424-8802**
- United States Coast Guard-Sector Houston – **281-464-4800**
- United States Fish and Wildlife Service (USFWS) – **281-286-8282**

State Agency Notification

- State of Texas Spill Reporting Hotline 24 hr – **800-832-8224**
- Texas General Land Office – 24 hr **800-832-8224** La Porte office - **281-470-6597**
- Texas Commission on Environmental Quality Houston office - **713-767-3563**
- Railroad Commission Houston office – **713-869-5001**
- Texas Parks & Wildlife Department Dickinson office – **281-534-0130**
- Texas Department of Public Safety Houston office – **281-517-1300**

Local Government Notification

- City of Pasadena Fire, Police, Emergency - **911**
- City of Pasadena Office of Emergency Management – **713-475-7800**
- City of Taylor Lake Village - **281-326-2843**
- Southeast Regional Local Emergency Planning Committee (SERLEPC) – CAER Line - **281-476-2237**

County Government Notification

- Harris County Sheriff's Department – **713-221-6000**
- Harris County Constable, Pct. 8 – **281-488-4040**
- Harris County Parks Department-Pct. 2 24hr – **713-455-0062**
- Harris County Pollution Control – **713-920-2831**
- Harris County Office of Emergency Management – **713-881-3100**

Pipeline Operators

- The Pipeline Group – **800-545-6005**
- Equistar Chemicals – **800-525-7516**
- Energy Transfer – **800-392-1965**
- ExxonMobil Pipeline – **800-537-5200**
- Genesis Pipeline – **800-806-5463**
- Air Liquide – **800-364-7368**
- Phillips 66 Pipeline – **877-267-2290**
- Enterprise Products Operations – **888-883-6308**

- Air Products – **800-572-6521**
- Kinder Morgan Pipeline – **800-633-0184**
- Texas Eastern Transmission – **800-231-7794**
- Dow Pipeline – **800-223-4412**
- Marathon Pipeline – **866-942-6571**
- Shell Pipeline – **800-852-7614**
- Buckeye Development and Logistics – **866-514-8380**