Texas Commission on Environmental Quality
Total Maximum Daily Load Program
GI-530

Improving Water Quality in the Galveston Bay System

A Survey of Dioxin and PCBs

High concentrations of dioxin (PCDDs) and polychlorinated biphenyls (PCBs) in fish tissue pose a risk to consumers. Both dioxin and PCBs can affect human health even at low concentrations and are extremely persistent in the environment.

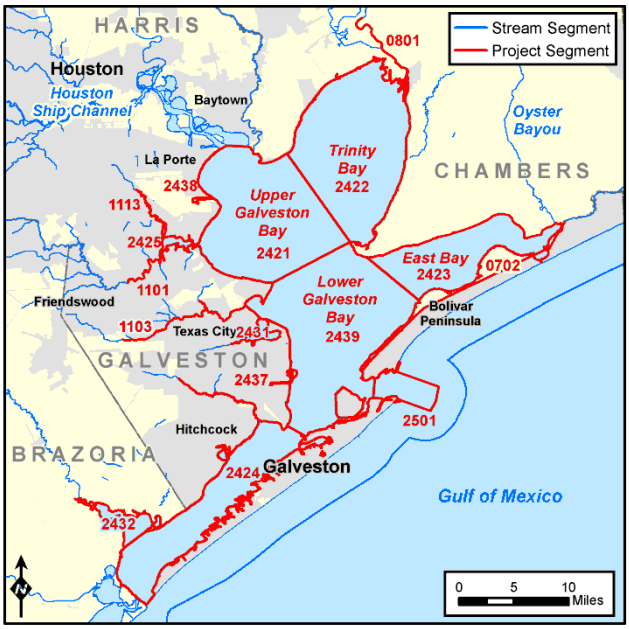
Dioxin is a generic term for a group of chemicals properly called polychlorinated dibenzodioxins (PCDDs), which share a common structure called dibenzodioxin, but vary in the number and location of attached chlorine atoms. Dioxin was never produced or used commercially, but is an ultra-trace byproduct of many industrial and chemical processes including: bleaching, organic chemical manufacturing, and low temperature combustion.

Polychlorinated biphenyls (PCBs) are a group of chemicals that share a common structure called biphenyl, but vary in the number and location of attached chlorine atoms. Prior to discovery of their toxicity in the early 1970's, PCBs were widely used in electrical equipment and sealants.

Exposure to dioxin can cause a variety of harmful health problems, including cancer, birth defects, diabetes, developmental delays, and immune system abnormalities. While PCBs are much less toxic than dioxin, they were once produced in quantity and the net health effects are similar.

In July 2008, the Texas Department of State Health Services (DSHS), in Advisory 35 (ADV-35), warned people to eat limited amounts of all catfish species and spotted sea trout from the Galveston Bay system due to dioxin and PCBs found in those fish species. DSHS advises pregnant or nursing women to eat none of these fish.

Advisory ADV-35 overlapped and extended ADV-28, which was issued in January 2005, and continued advisories from 1990 and 2001. ADV-28 advised consumers to eat limited quantities of spotted sea trout from Upper Galveston Bay and the Houston Ship Channel due to PCB contamination. Pregnant or nursing women were advised not to eat any sea trout from the area covered by the advisory. Since 1990, DSHS has also warned people to limit or stop eating catfish and blue crabs (ADV-3 and ADV-20) in the same Houston Ship Channel area covered by ADV-35 because of



dioxin. DSHS renewed and combined the various advisories for the Ship Channel and bay watersheds in 2013 in ADV-49.

This survey project collected data from areas that were added by ADV-35. The primary purpose of this survey was to determine the distribution of PCBs and dioxin throughout the bay system.

A map of the ADV-49 area and additional consumption advice are available on the DSHS webpage Fishing Advisories, Bans, and FAQs about Bodies of Water—Seafood and Aquatic Life[1]. Learn more about water quality standards, monitoring, and TMDLs by reading Preserving and Improving Water Quality[2], available on our website and in print.

Galveston Bay Watershed

The Galveston Bay system supports commercial navigation that is important to the surrounding region, and was a reason for the historic growth of the Houston-Galveston area economy. The bay system and its headwater reaches, tributaries, and fringes provide recreational opportunities and support sport fisheries that are economically important to residents.

[1] http://www.dshs.texas.gov/seafood/advisories-bans.aspx

[2] https://www.tceq.texas.gov/publications/gi/gi-351

The watershed includes portions of the following political jurisdictions:

- *Counties*: Brazoria, Chambers, Fort Bend, Galveston, Harris
- *Cities*: Houston, Pasadena, Baytown, La Porte, Deer Park, Texas City, Galveston, and numerous other communities

Waterways in the Project Area

The area covered by ADV-35 includes Galveston Bay, Chocolate Bay, East Bay, West Bay, Trinity Bay, and contiguous waters. The area covered in ADV28 includes the Houston Ship Channel downstream of the Lynchburg Ferry crossing and all its contiguous waters, which include Upper Galveston Bay north of a line drawn from Red Bluff Point to Five Mile Cut Marker to Houston Point.

This project addressed waters south or east from Morgan's Point that are covered by ADV-35, but which were not covered under previous advisories (Tables 1 and 2). Within the context of this project, "Galveston Bay system" will be used to refer to this area.

Public Participation

In all its projects, TCEQ seeks to gather opinion and information from people who represent government, permitted facilities, agriculture, business, environmental, and community and private interests in the watershed. Public meetings about this project were usually concurrent with meetings for the two other TMDL Program projects for dioxin and PCB that have focused on the Houston Ship Channel system.

The Houston-Galveston Area Council (H-GAC) coordinated public participation in this project. The H-GAC also coordinated, as needed, with the Texas Clean Rivers Program Steering Committee and the Technical Advisory Group (TAG) for the San Jacinto River Basin and associated coastal basins.

For More Information

Send an e-mail to tmdl@tceq.texas.gov or call 512-239-6682. Visit the project webpage at:

www.tceq.texas.gov/waterquality/tmdl/96-galvsyssurvey

H-GAC project information is online at:

www.h-gac.com/community/water/tmdl/

Table 1. All of these segments were included

Segment	Name
2421	Upper Galveston Bay
2422	Trinity Bay
2423	East Bay
2424	West Bay
2425	Clear Lake
2431	Moses Lake
2432	Chocolate Bay
2437	Texas City Ship Channel
2438	Bayport Channel
2439	Lower Galveston Bay

Table 2. Parts of these segments were included

Segment	Name
0702	Intracoastal Waterway Tidal (portion adjacent to Bolivar Peninsula and East Bay)
0801	Trinity River Tidal
1101	Clear Creek Tidal
1103	Dickinson Bayou Tidal
1113	Armand Bayou Tidal
2501	Gulf of Mexico (around Galveston entrance jetties)

Project Highlights

- In September 2009, TCEQ initiated a contract with the University of Houston (UH) to conduct sampling and analysis of water, sediment, and fish tissue.
- The targeted monitoring was completed in 2012.
- H-GAC, TCEQ, and UH project staff presented information about the project results to the Dioxin and PCBs Stakeholder Group in November 2012.
- EPA has a Superfund Project for the San Jacinto River Waste Pits[3], which are one of the sources of dioxin in the Ship Channel, to clean up the contamination from the waste pits.

[3] https://www.epa.gov/tx/sjrwp