



Improving Water Quality in Lavaca Bay and Chocolate Bay

Assessing the Aquatic Life Use

The state of Texas requires water quality in Lavaca Bay and Chocolate Bay (Segment 2453) to be suitable for swimming, a healthy aquatic ecosystem, and the production of edible species of clams, oysters, and mussels. However, monitoring indicated that dissolved oxygen concentrations were occasionally low; mercury levels were elevated in the water and in some species of fish and crabs; and elevated bacteria concentrations prevented harvesting of shellfish.

Oxygen, which dissolves in water, is essential for the survival of aquatic life. While the amount of dissolved oxygen in water fluctuates naturally, various human activities can cause unusually or chronically low dissolved oxygen levels that may harm fish and other aquatic organisms. Mercury, a metal, accumulates in the tissue of aquatic species and is toxic to humans if consumed in large quantities over an extended period of time. Bacteria in water from human and animal waste may indicate the presence of disease-causing microorganisms that pose a threat to public health if ingested.

In response to these conditions, the TCEQ's Total Maximum Daily Load (TMDL) Program developed this project to assess the mercury and dissolved oxygen problems. TCEQ developed a separate statewide project for bacteria in oyster waters.

Learn more about water quality standards, monitoring, and TMDLs by reading [Preserving and Improving Water Quality](#)¹, available on our website and in print.

Lavaca and Chocolate Bays Watersheds

Segment 2453 includes Lavaca Bay and Chocolate Bay, which are part of the larger Matagorda Bay System located on the Texas Gulf Coast. Together these bays comprise 54.8 square miles. The average depth of both bays is 4 feet; however, Lavaca Bay can be as deep as 7 feet naturally, and is 35-40 feet deep in dredged channels. The major tributaries to the bays are the Lavaca and Navidad Rivers. Venado, Garcitas, and Placedo Creeks are also important contributors of fresh water to the bays. Oyster beds and reefs are numerous, as are marshes and wetlands. The watershed is federally identified as the West Matagorda Bay Watershed, USGS Cataloging Unit: 12100402. Counties in the watershed include Calhoun, Victoria, and Jackson. Port Lavaca and Point Comfort are the major communities.



Project Development

The TMDL Program contracted with two universities to collect more data in order to better understand the nature and extent of the low dissolved oxygen conditions and the elevated concentrations of mercury in water. The University of Texas Marine Science Institute (UTMSI) collected data to characterize the low dissolved oxygen conditions and evaluate the appropriateness of the dissolved oxygen standard as applied to the bays. Texas A&M University-Galveston (TAMU-Galveston) sampled mercury in water to obtain a more comprehensive data set for analysis. Results from these two projects determined that water quality standards for dissolved oxygen and mercury in water were being met and that TMDLs were not necessary.

Mercury in fish and crab tissue is being addressed by the Superfund Program. The Superfund Program has established the same endpoint as would a TMDL, that is, to reduce mercury in fish and crab tissue to levels safe for human consumption.

Given the remediation work required and the legally binding nature of the Superfund Program, TCEQ did not develop a TMDL for mercury. According to EPA guidelines, a TMDL is not required when other

¹ <https://www.tceq.texas.gov/publications/gi/gi-351>

pollution control requirements are reasonably expected to result in the restoration of the affected use.

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.

TCEQ received public input for this project through two existing Citizen Advisory Panels (CAPs)—the Alcoa and the Formosa groups. The first meeting was held in August 2001 with the Alcoa CAP. Project staff outlined the scope of the TMDL project and listened to comments from the group members. In December 2003, TCEQ met with the Formosa CAP to discuss the same topics.

For More Information

Email us at tmdl@tceq.texas.gov or call us at 512-239-6682. Or visit the project webpage at:

www.tceq.texas.gov/waterquality/tmdl/27-lava-cabay.html

For more information about the Superfund project, see the EPA's webpage at:

<https://cumulis.epa.gov/supercpad/courses/csinfo.cfm?id=0601752>

Project Dates

Start Date: April 2001

End Date: December 2003

Project Highlights

- In 2002 - 2003, UTMSI collected field data for dissolved oxygen and TAMU-Galveston sampled for mercury in water. Analysis of the new data indicated that water quality standards for dissolved oxygen and mercury in water are being met and TMDLs are not necessary.
- Under the Record of Decision established between EPA and Alcoa in 2001 and a Consent Decree entered by the U.S. District Court in 2005, the measures necessary to reduce mercury in fish and crab tissue to levels safe for human consumption have been implemented. EPA issued the Preliminary Close Out Report documenting that all construction activities required by the Record of Decision and Consent Decree were completed. The remediation of Lavaca Bay consisted of a series of projects that: (1) addressed ongoing sources of mercury (for example, hydraulic control of mercury-contaminated groundwater), (2) stabilized a historic dredge-material disposal site, (3) removed mercury-contaminated sediments from Lavaca Bay through dredging, and (4) allowed for the natural recovery of sediments through natural sedimentation.
- Alcoa performs annual monitoring of sediment, fish, and shellfish to evaluate the effectiveness of the remedy. The results of monitoring are compiled annually in a Remedial Action Annual Effectiveness Report, which is submitted to EPA in March of each year.