



Improving Water Quality in Patrick Bayou

A TMDL Project for Toxicity, Copper, and Temperature

Patrick Bayou was placed on the Texas Clean Water Act Section 303(d) List of impaired waters. The reasons for listing the bayou were presented in the 1998 list and were modified somewhat in the 1999 list. They included:

- Average dissolved copper concentrations above levels established to protect aquatic life.
- Water and sediment toxicity levels above levels established to protect aquatic life.
- Water temperatures above levels established to safeguard general water quality uses.

Additional data further supported the existence of water quality concerns in Patrick Bayou. These included evidence of a degraded benthic macroinvertebrate community and levels of metals and organics that exceeded screening levels.

In response to these conditions, a total maximum daily load (TMDL) project was initiated. A TMDL is like a budget—it determines the amount (or load) of a particular pollutant a body of water can receive and still support its designated uses. The allowable load is then allocated among categories of sources within the watershed, and measures to reduce pollutant loads are developed as necessary.

Specific objectives of the Patrick Bayou project included:

- Determining whether water quality conditions had changed after additional limits were added to wastewater discharges.
- Identifying specific pollutants causing toxicity.
- Determining the appropriate strategy for addressing the impairments to water quality.

Learn more about water quality standards, monitoring, and TMDLs by reading *Preserving and Improving Water Quality*, available on our website at www.tceq.texas.gov/goto/tmdl/.

The Patrick Bayou Watershed

Patrick Bayou is a small tributary of the Houston Ship Channel. The bayou flows in a northerly direction and discharges into the south side of the Houston Ship Channel approximately 3.7 km upstream of its confluence with the San Jacinto River. A portion of Patrick Bayou lies south of SH 225, is largely concrete lined, and serves as drainage for the City of Deer Park. Im-



mediately downstream of SH 225, the first 1.3 km of the bayou flows through either concrete culverts or a gunite-lined channel. The bayou downstream of this point has earthen banks and a soft mud bottom.

A majority of the bayou north of SH 225 is tidally influenced to some degree. The bayou is affected by industrial and municipal wastewater discharges and by storm water runoff from industrial and urban areas. The watershed includes portions Harris County and the city of Deer Park.

Public Participation

In all its projects, the TCEQ gathers opinions and information from people who represent government, permitted facilities, agriculture, business, environmental, community, and private interests in the watershed. The Patrick Bayou Lead Organization (PBLO), a consortium of permittees that discharge to Patrick Bayou, funded scientific studies to develop recommendations for this project. The member represented the City of Deer Park, Lubrizol, Oxy Vynyls, Praxair, Rohm and Haas Texas, and Shell Inc.

Parsons Engineering Science, Inc. performed technical work for the project, including work plan development, water and sediment sampling, data analyses, modeling, and report compilation.

Local stakeholders also participated in the project. Public participation was coordinated through the Patrick Bayou TMDL Public Participation Panel. The panel included representatives of the PBLO, community members serving either as individuals or as representatives of groups, and the TCEQ project manager. Informal observers participated as well. Meetings were arranged, conducted, and documented by a professional facilitator. Reports and recommendations were developed in conjunction with the Public Participation Panel and were submitted to the stakeholders and the PBLO in 2002.

Status and Implementation

Analyses of data collected through April 2001 indicated that water toxicity and dissolved copper no longer exceeded water quality standards due to new limits implemented by dischargers. Those controls will continue, so no TMDL allocations to address water toxicity or dissolved copper were prepared.

In September 2002, Patrick Bayou was added to the Superfund National Priority List. Progress in remediating sediment toxicity at the Patrick Bayou Superfund site is available on the EPA's website at <<http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0605329#CleanupProgress>>.

The major source of heated-water discharge has closed since the study, and bayou temperatures have not been observed to exceed the temperature criterion since then.

The tidal portions of Patrick Bayou support abundant wildlife in the form of birds (such as ducks, shorebirds, roseate spoonbills, ospreys), and turtles and fish.

For More Information

To learn more about this project, contact one of the people listed below, or visit the project Web page at:

<www.tceq.texas.gov/waterquality/tmdl/18-patrickbayou.html>

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Project Highlights

- Four major sampling events were conducted from August 2000 through April 2001.
- Analyses of data collected through April 2001 indicated that water toxicity and dissolved copper no longer exceeded water quality standards due to control actions previously implemented by dischargers. Those controls will continue, so no TMDL allocations to address water toxicity or dissolved copper were needed.
- The major source of heated-water discharge has closed since the study, and bayou temperatures have not been observed to exceed the temperature criterion since then.
- The last planned meeting of the Public Participation Panel occurred on August 29, 2002. In 2002, the PBLO prepared formal documentation of data and analyses, with recommendations concerning water temperature and sediment toxicity.
- In September 2002, Patrick Bayou was added to the Superfund National Priority List, based on sediment testing performed independently of this TMDL project. Progress in remediating sediment toxicity at the Patrick Bayou Superfund site is available on the EPA's website at <<http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0605329#CleanupProgress>>.

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