Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY

Texas

Educating Residents and Collecting Household Hazardous Waste Items Reduces Legacy Pollutants in Fosdic Lake

Waterbody Improved

In 1995 the Texas Department of State Health Services (DSHS) banned the possession of fish taken from Fosdic Lake in Fort Worth because of high concentrations of potentially harmful chemicals in the fish tissue. As a result, Texas added Fosdic Lake to its Clean Water Act (CWA) section 303(d) list of impaired waters in 1996. In response to the ban, local, state and federal agencies coordinated data collection and education/outreach efforts in the city of Fort Worth to reduce the inflow of harmful chemicals into area lakes. Recent monitoring shows that the pollutant levels in fish from Fosdic Lake have diminished sufficiently to allow for their safe consumption, prompting DSHS to lift the fish possession ban in 2007. The lake was removed from the 2008 impaired waters list for dichlorodiphenyldichloroethylene (DDE), dieldrin and chlordane.

Problem

Fosdic Lake (Figure 1) is a 7-acre manmade impoundment (segment 0806A) on a tributary of the West Fork Trinity River in Tarrant County. Built between 1909 and 1912, the lake drains a 262-acre residential watershed in east Fort Worth. In 1995 lake fish tissue monitoring data showed elevated levels of several legacy pollutants, including chlordane, DDE, dieldrin and polychlorinated biphenyls (PCBs), prompting DSHS to issue a ban on the possession of all fish species from Fosdic Lake. As a result, the Texas Commission on Environmental Quality (TCEQ) placed Fosdic Lake on its 1996 CWA section 303(d) list as impaired for its designated fish consumption use.

Legacy pollutants are substances that have been banned or restricted but remain in the environment. Chemical substances like chlordane, DDE, dieldrin and PCBs were widely used as pesticides, coolants and lubricants from about 1946 until they were eventually restricted between 1972 and 1988. In spite of the restrictions on the substances, area soils continued to be contaminated through direct application, leaks and spills. Extensive urban development from the late 1950s until the early 1990s caused contaminated soils to erode and accumulate in Fosdic Lake. The pollutants then entered the food chain and became concentrated in fish tissue.

Photo by John Mummert, TCEQ Region 4.

Figure 1. Fosdic Lake is in East Fort Worth, Texas.

On November 17, 2000, TCEQ and the U.S. Environmental Protection Agency (EPA) approved a total maximum daily load (TMDL) for Fosdic Lake to address legacy pollutants in fish tissue. The endpoint of the TMDL was to restore the fish consumption use by meeting the DSHS' criteria for contaminant levels.

Project Highlights

The Fort Worth Environmental Management Department (FWEMD) operates the Environmental Collection Center (ECC), a permanent, year-round facility that accepts household hazardous waste from residents of Fort Worth and other areas. In consultation with TCEQ and EPA, the ECC modified its record-keeping system to track the amounts of legacy pollutants collected at the center. The city used the information as a measure for evaluating its pollution prevention program and targeting its educational efforts.

As part of the TMDL effort, TCEQ collaborated with the U.S. Geological Survey (USGS) in 2004 to collect and analyze sediment and runoff samples from the watershed to evaluate the loading of legacy pollutants and to identify trends and sources of the pollutants. The TMDL collaboration effort also included collecting fish tissue samples, an effort funded in part by a CWA section 319 grant. The goal was to develop the quantitative risk characterization that eventually became the basis for the revised health risk assessment that DSHS adopted in 2008.

Results

Pollution prevention and source control practices such as the public education and household hazardous waste collection programs implemented by the City of Fort Worth contributed to the reduction of pollutants. The City's educational program resulted in an overall 21 percent increase in the use of its permanent household hazardous waste facility. As of 2006, the ECC had collected and logged more than 8,000 pounds of materials containing legacy pollutants. The educational program was also highly successful in informing the public about the quality of urban lakes and the possible public health and environmental risks of potential contaminants. The combination of these investigations, management activities, and the natural attenuation of the pollutants has proven to be effective for Fosdic Lake.

Through 2006, sampling of residential stormwater outfalls showed that legacy pollutants continued to be present in urban runoff. Recent fish tissue monitoring data, however, indicated that the pollutant levels in fish from Fosdic Lake had diminished sufficiently to allow for their safe consumption, prompting DSHS to lift the fish possession ban in 2007. According to a January 15, 2008, DSHS article, fish tissue monitoring showed that, with the exception of PCBs, concentrations of legacy pollutants were in compliance with the target health assessment comparison (HAC) values in the TMDL (Figure 2). As a result, TCEQ removed the impairment designation for chlordane, dieldrin and DDE in 2008. Although there has been a distinct downward trend in PCB concentrations, levels remain sufficiently elevated to warrant a consumption advisory and impairment designation.

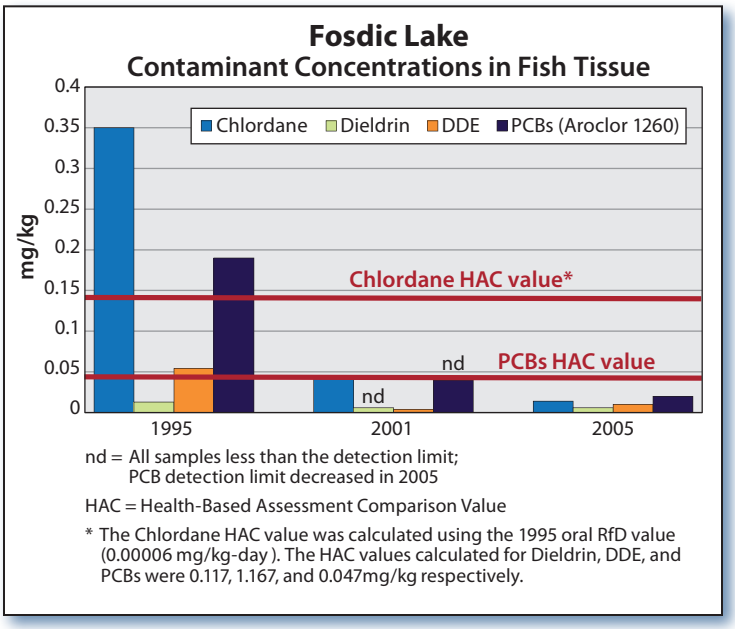

Figure 2. Concentration of legacy pollutants in fish tissue, 1995–2005.

Partners and Funding

Funding for this project involved multiple in-kind sources and the cooperation of many partners. The City of Fort Worth contributed to the project by conducting public outreach and collecting hazardous household waste. The USGS investigated the status and trends of legacy pollutants in sediments. TCEQ and the USGS each contributed $39,000 (for a total cost of $78,000) for the joint investigation. TCEQ contributed approximately $25,000 in EPA CWA section 319 funds to support DSHS' analytical expenses for the most recent fish tissue analysis. DSHS matched the grant with salaries and in-kind services to collect the samples and develop the risk characterizations.

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