Story by Kathy Wythe

Proposed water quality standards move Texas closer to cleaner waters

As Texas concentrates on cleaning up its water through Total Maximum Daily Loads (TMDLs), TMDL Implementation Plans (I-Plans), and watershed protection plans (WPPs), many water quality experts in Texas are realizing that applying a single standard of primary contact recreation to hundreds of different surface water bodies may not be realistic or beneficial.

While public interest is high in having an ambitious standard as possible, Jim Davenport, technical specialist for the monitoring and assessment section at the Texas Commission on Environmental Quality (TCEQ), said a standard that is too ambitious "becomes problematic" as the list of impaired waters grows.

"It becomes important to tailor our recreation use standards appropriately," he said. "For a water body that doesn't have full primary contact recreation such as swimming, it is important to set our standards to meet its actual use."

With that in mind, TCEQ's Surface Water Quality Standards Advisory Work Group has been working with stakeholders on expanding its water quality standards, including those standards for recreational use. TCEQ has proposed expanding the categories for contact recreation use from two categories—contact recreation and non-contact recreation—to four, adding two more levels: secondary contact 1 and 2 (see definitions on page 19).

The agency is also proposing different numerical criteria for *E. coli* that will be applicable in fresh water based on these assigned recreational uses. Currently the geometric mean criterion for *E. coli* is 126 colonies per 100 milliliters for contact recreation. Under the proposed revised standards, the geometric mean for primary contact recreation category would increase to 206 colonies per 100 milliliters, 630 colonies per 100 milliliters for secondary contact 1, and 1,030 colonies per 100 milliliters for secondary contact 2.

For salt water, *Enterococci* bacteria are used as indicator bacteria for aquatic recreation. The geometric mean for primary contact is proposed to remain at 35 colonies per 100 milliliters while secondary contact 1 is proposed as a new recreational use category with a geometric mean criterion of 175 colonies per 100 milliliters, Davenport said.

By having standards that more accurately reflect actual use, Davenport said the agency can focus its resources on water bodies that should have primary contact recreation use designation but do not meet it. "Because we are seriously attacking water quality problems, we have to make sure we target effectively," he said. "Our goal is to make sure we have reasonable standards so when we do a TMDL, we have an appropriate target to go for."

At its January 2010 meeting the commission agreed that the complete standards should be proposed to the public and set a March public hearing on the standards and the procedures to implement the standards. The target date for adoption of the standards by TCEQ is July, with an effective date of August 2010.

Dovetailed with the changes in standards is the use of recreational use attainability analyses or RUAAs, which characterize the impaired water body and then are used to determine which recreational use category is most appropriate for a particular water body.

Davenport said TCEQ has used UAAs for other standards but the agency is just beginning to use UAAs for recreation. Along with TCEQ's water quality standards group and TMDL program, the Texas State Soil and Water Conservation Board is using RUAAs for some of its projects.

During RUAAs, Davenport said, agency staff, university researchers, or private con-

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sultants conduct one to three surveys on the water body. They determine if there is any recreation activity on the water and/or public access to the water and measure the flow and depth of the water.

The surveyors also look at historical records and interview people who know the area.

"You can only get so much information with surveys," he said. "Observations from local people are important."

Dr. Larry Hauck of Tarleton State University's Texas Institute of Applied Environmental Research and his staff are conducting RUAAs in the Dallas/Fort Worth area and in the Atascosa River watershed.

"The premise is that through site visits, looking at historical records, and talking to local people, you can reconstruct what recreational activities have happened in the past and what is occurring in the present at these various stream systems you are studying," Hauck said. "We are actually gathering data that will indicate what the true level of recreational use occurring, as determined from studies."

water quality standards

Water quality standards are the foundation for managing surface water quality. A standard consists of two parts:

- a use, or the purposes for which surface water will be used
- the criteria or the indicators used to determine if the use is met

Davenport said the two agencies have more than 120 RUAAs being conducted. Depending on the results of the RUAAs and standards revisions, water bodies could be put into one of the four proposed categories of contact recreation, and, depending on the associated bacteria counts, some of the water bodies may no longer be listed on the state's impaired water body list.

The proposed expanded contact recreation use and water quality standards, along with the RUAAs, will provide a better starting point for developing TMDLs, TMDL I-Plans, and WPPs, paving the way for improved water quality in Texas.

"Prior to this study, we did not have any data comparing feces of cattle versus wildlife to determine what kind of *E. coli* loads we had," he said, adding that such findings have not been published previously in the literature.

The scientists are also identifying the different types of land uses throughout the watershed, which helps determine what animals may be on the land. For example, Karthikeyan said, if they know the watershed has cattle ranches, they can estimate the number of cattle on the land and calculate the potential amount of bacteria from the cattle wastes.

Information obtained during the sanitary survey provides input data for the modeling tool SELECT—Spatially Explicit Load Enrichment Calculation Tool. This model was developed and applied by Karthikeyan's graduate students Aarin Teague, Kendra Reibschleager, and Kyna McKee to analyze the land use and animal and human sources in the watershed to determine the potential bacteria sources and their contributions. SELECT then helps the researchers develop a pie chart with the different percentage contributions from each potential source.

"We wanted to see what sources are really contributing, and what percent each source is really contributing to the creek," Karthikeyan said. ⇨

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