Pesticides in Urban Groundwater

During monitoring and investigation activities, Texas Commission on Environmental Quality's (TCEQ) Public Drinking Water Section and the United States Geological Survey (USGS) discovered common situations that could lead to pesticides entering groundwater, including:

- Improperly using pesticides such as not following Labeling instructions.
- Mixing or loading pesticides in facilities located near water wells.
- Applying pesticides near abandoned, improperly plugged, or corroding water wells.
- Using pesticides near seasonal surface water features such as playa lakes and intermittent creeks.
- Using an especially high amount of pesticides.

History

This timeline details past and current pesticide monitoring activities.

1990s

TCEQ began to use a screening procedure called an immunoassay to measure pesticide residues. This method detects certain pesticides at very low concentrations. Using this new method, TCEQ began to screen groundwater samples collected from rural areas across the state. This was the first statewide screening program for atrazine, a popular herbicide.

2000

- Laboratory method for atrazine decreased the detectable amount from 1 to 0.1 parts per billion (ppb).
- The statewide aquifer screening program added another herbicide, metolachlor.
- TCEQ began coordinating groundwater monitoring with the Texas Water Development Board and individual groundwater conservation districts.
- TCEQ collected and analyzed groundwater samples for atrazine and metolachlor over a seven-year period. Detections of both pesticides were very low with concentrations of less than 0.05 ppb, or about 0.05 ounces in 31,000 tons.
- TCEQ identified a clustering of low atrazine detections located in five Public Water Systems (PWSs) in the central Panhandle. Most of the atrazine concentrations were below the drinking water Maximum Contaminant Level (MCL) of 3 ppb.
- A few water wells triggered Texas State Pesticide Management Plan activities.

  - Texas A&M AgriLife Extension worked with crop producers and water well owners to provide education and outreach in the Panhandle region of the state.
  - TCEQ used the data to focus educational and outreach efforts.

- 2,4-D replaced metolachlor.

2007

- TCEQ began sampling groundwater in urban areas. San Antonio and Austin were part of this sampling effort.
- Testing began for the five pesticides or pesticide families using the immunoassay screening method. Pesticides or pesticide family tested include atrazine, pyrethroids, chlorpyrifos, diazinon, and a limited number of organophosphates/carbamates. These pesticides are, or were, used in lawn care and homeowner pest control. The use of diazinon for lawn care or homeowner pest control is no longer approved.
- Detections were few, all were in low concentrations.
- TCEQ continued urban pesticide monitoring through 2010.
  - TCEQ expanded the monitoring to include springs.
  - TCEQ added pesticides that were not monitored before.

2010

- TCEQ began monitoring golf courses.
- TCEQ monitored the primary cotton crop area in the southern and central portions of the Panhandle. The results of this study showed that pesticides have limited impact on groundwater. There were very few detections of atrazine and diazinon and those detections were at very low concentrations. There were detected in trace amounts of 2,4-D and alachlor.

2011

- In 2011, TCEQ monitored the Lower Rio Grande Valley and Corpus Christi areas, with only low detections in few wells.

2016

- TCEQ monitored areas near apiaries (i.e., areas where bees are kept) in Central Texas for Pollinator Protection efforts, with few low detects of the few pesticides analyzed.

2018

- TCEQ monitored the I-35 corridor from Round Rock to Waxahachie, with just a few detections at low levels.

Pesticide monitoring continued through 2023. Results from the last two years showed isolated detections near 3 ppb in the Panhandle Region. Most detections were low and scattered across the state. Trace amounts of atrazine were found in the Central Panhandle PWSs. During previous sampling detections in this area were close to the MCL of 3 ppb.

Well owners and pesticide applicators can make corrections and avoid or reduce potential contamination in the future. Please refer to *How Do You Prevent Pesticide Contamination of Private Water Wells?* (https://tgpc.texas.gov/POE/FAQs/PesticidesPrivateWaterWells_FAQ.pdf) which provides more information on common ways to avoid contaminating a water well and groundwater.

State and local agencies are working hard to protect the state's water resources and water quality for the present and the future. With the help of educated, caring citizens, together we can protect, conserve, and ensure clean drinking water for generations of Texans to come.

References

- Texas State Management Plan for Prevention of Pesticide Contamination of Groundwater (TCEQ SFR-070/01), https://wayback.archive-it.org/414/20210904135754/https://www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/070_01.pdf
- Protecting the Environment Using Integrated Weed Management in Lawns (AgriLife Extension L-5324), https://agrilifelearn.tamu.edu/s/

Websites

- Texas Groundwater Protection Committee, https://tgpc.texas.gov/
  - Agricultural Chemicals Subcommittee historical records, https://tgpc.texas.gov/tgpc-subcommittees/tgpc-agricultural-chemicals-subcommittee/
  - Pesticides, https://tgpc.texas.gov/pesticides/
- Texas Department of Agriculture Pesticide Program, https://texasagriculture.gov/Regulatory-Programs/Pesticides
- TCEQ Pesticides and Groundwater, https://www.tceq.texas.gov/groundwater/groundwater-planning-assessment/pesticides.html

- Tex*A*Syst website, https://blackland.tamu.edu/decision-aids/texstarastarsyst/
- Tex*A*Syst publication (especially B-6025), "Tex*A*Syst: Reducing the Risk of Ground Water Contamination by Improving Pesticide Storage and Handling," https://blackland.tamu.edu/decision-aids/texstarastarsyst/reducing-contamination-by-improving-pesticide-storage-and-handling/

Other Frequently Asked Questions (FAQs)

To find additional FAQs visit the Texas Groundwater Protection Committee's FAQ webpage at https://tgpc.texas.gov/frequently-asked-questions-faqs.