

How Is Pesticide Contamination of Private Water Wells Prevented ?

Pesticides have been detected in groundwater in numerous locations throughout the state. Testing by the Texas Commission on Environmental Quality (TCEQ) in both urban and rural areas has detected several pesticides in groundwater samples. Most commonly, the contaminants are atrazine, diazinon, and metolachlor, and they have mostly been found at trace to low levels. Monitoring for pesticides in groundwater can identify potential problem areas and allow state and federal agencies to efficiently focus limited resources.

In 1999, TCEQ began using a screening procedure called immunoassay to measure pesticide residues. This method is capable of detecting certain pesticides at lower levels than previously possible, and it was used to screen groundwater samples collected from rural areas across the state. This was the first statewide screening program for atrazine, a commonly used herbicide.

In 2000, another herbicide, metolachlor, was added to the statewide aquifer screening program. Coordinating with the Texas Water Development Board and individual Groundwater Conservation Districts (GCDs), TCEQ collected and analyzed groundwater samples for atrazine and metolachlor over a seven-year period. In general, immunoassay screening detected very low levels of atrazine and metolachlor. However, some areas had greater concentrations and triggered further investigation. Statewide cooperative monitoring, and TCEQ immunoassay screening for atrazine (and selected other pesticides), continues to this day.

Concerns regarding the use and handling of pesticides were identified:

1. Improper location of mixing/loading areas relative to water wells;
2. Improperly maintained water wells;
3. Spills and/or operations at former applicator sites;
4. Off-label applications; and,
5. Sites associated with seasonal surface water features such as playa lakes and intermittent creeks.

Along with the Texas A&M AgriLife Extension Service (AgriLife Extension), TCEQ provided education and outreach to agriculture producers and water well owners in the Southern High Plains region of the state.

In addition, proper adherence to product label directives would significantly reduce these concerns. Strict adherence to the product label is highly encouraged and is mandated by federal and state law. The legal system of the United States considers the product label a legal document.

The pesticide product label delineates the set of conditions, directions, and precautions that define who may use a pesticide, as well as where, how, how much, and how often it may be used. Improper use or misapplication of a pesticide can be punishable by fine or pesticide license revocation. Additional information can be obtained from your county

AgriLife Extension Agent, the Texas Department of Agriculture, or your pesticide distribution/sales representative.

In 2007, TCEQ began sampling groundwater in urban areas, specifically, San Antonio and Austin. Immunoassay methodology was used to test for the following five pesticides or pesticide families: atrazine, pyrethroids, chlorpyrifos, diazinon, and a limited number of organophosphates/carbamates. These pesticides are, or were, used in lawn care and homeowner pest control. However, the use of diazinon for lawn care or homeowner pest control is no longer approved.

In 2008, TCEQ again sampled groundwater in San Antonio, Austin, and in the Houston area. The pesticides analyzed were similar to the previous year, with the exception of 2,4-D replacing the pyrethroids in the sampling scheme. Results of this sampling round were similar to the results of 2007. Only trace amounts of atrazine and diazinon were detected.

It is not certain how pesticide contamination occurs; however, one potential source is thought to be wellhead contamination from improper pesticide use, location, and/or mixing and loading practices near water wells.

If there is a water well on your property, you are encouraged to evaluate your property relative to the safe use of pesticides. In addition to strict adherence to the label, the following precautions are highly encouraged prior to the use of pesticides on your property:

1. Limit the use of pesticides near your water well and any nearby underground lines or water well locations, burn pits, surface drainage, or ponds.
2. Do not store or mix pesticides, or store or wash pesticide application equipment, near water wells, and all faucets used for this purpose should have a backflow preventer.
3. Know the location of, and avoid using pesticide near, abandoned water wells or petroleum production, exploration, or disposal wells.
4. Know your soil type and local topography to ensure that surface water does not carry contamination to, and collect around, the water well or underground lines.
5. Make sure that your water well is in good condition by checking and testing it regularly. See the References below for information regarding the proper maintenance of water wells.
6. Contact your local water planning group, county Extension Agent, and GCD for more information on aquifer characteristics and limitations.

Adherence to proper pesticide use as per the label and knowledge of local water dynamics can help protect your drinking water and your family's health, as well as safeguard the state's groundwater resources. Your state and local agencies are working hard to protect the state's water resources for the present and the future. With the help of informed, caring citizens, together we can protect, conserve, and ensure clean water for generations to come.

References:

- Material Data Safety Sheet (MSDS) information for pesticide-active ingredients, <http://www.cdms.net/>
- Landowner's Guide to Plugging Abandoned Water Wells (TCEQ RG-347) – https://www.tceq.texas.gov/assets/public/comm_exec/pubs/rg/rg-347.pdf
- Capping of Water Wells for Future Use (AgriLife Extension L-5490) – <http://www.agrilifebookstore.org/Default.asp>
- Solving Water Quality Problems in the Home (AgriLife Extension L-5450), in Spanish (AgriLife Extension L-5450S) – <http://www.agrilifebookstore.org/Default.asp>
- Protecting the Environment Using Integrated Weed Management in Lawns (AgriLife Extension L-5324) – <http://www.agrilifebookstore.org/Default.asp>
- Texas State Management Plan for the Prevention of Pesticide Contamination of Groundwater (TCEQ SFR-070/01) – https://www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/070_01.pdf

Websites:

- Texas Groundwater Protection Committee (TGPC), <http://www.tgpc.texas.gov>
 - Agricultural Chemicals Subcommittee, <http://tgpc.texas.gov/tgpc-subcommittees/tgpc-agricultural-chemicals-subcommittee/>
 - Pesticides, <http://tgpc.texas.gov/pesticides/>
- Texas Department of Agriculture Pesticide Program, <http://www.texasagriculture.gov/RegulatoryPrograms/Pesticides.aspx>
- TCEQ Pesticides and Groundwater, <https://www.tceq.texas.gov/groundwater/pesticides.html>
- Texas Water Resources Education, <http://texaswater.tamu.edu/>
- Texas Department of Licensing and Regulation
 - Abandoned and/or Deteriorated Wells, <http://www.license.state.tx.us/wwd/wwd.htm#adw>
 - Abandoned Well Determination Checklist, <http://www.license.state.tx.us/wwd/Abandoned%20Well%20Determination%20Checklist.pdf>
 - Texas Well Report Submission and Retrieval System, <http://www2.twdb.texas.gov/apps/sdr/default.aspx>
- Water Conservation Implementation Task Force of the Texas Water Development Board, Special Report to the 79th Legislature, https://www.twdb.texas.gov/conservation/resources/doc/WCITF_Leg_Report.pdf, BMPs for Municipal Water Users (p. 25 – 26 of pdf file)
- Texas Alliance of Groundwater Districts, <http://www.texasgroundwater.org/>
- Texas Well Owner Network (TWON) Publications, <http://twon.tamu.edu/publications/>
- Tex*A*Syst website, <http://blackland.tamu.edu/decision-aids/texasyst/>
 - Tex*A*Syst publication (especially B-6025), *Tex*A*Syst: Reducing the Risk of Ground Water Contamination by Improving Pesticide Storage and Handling*, <http://blackland.tamu.edu/decision-aids/texasyst/reducing-contamination-by-improving-pesticide-storage-and-handling/>

- Texas State Soil and Water Conservation Board, <https://www.tsswcb.texas.gov/>
- AgriLife Extension Agents, <http://county-tx.tamu.edu/>
- U.S. Environmental Protection Agency (EPA) Integrated Pesticide Management Fact Sheet, <http://www.epa.gov/pesticides/factsheets/ipm.htm>
- U.S. EPA Pesticides and Consumers website, <http://www.epa.gov/safepestcontrol/>

For additional Frequently Asked Questions (FAQs) related to groundwater quantity, groundwater quality, septic systems, water wells, administrative entities, and publications, visit the TGPC's FAQs webpage at <http://tgpc.texas.gov/frequently-asked-questions-faqs/>.