The Texas Commission on Environmental Quality (TCEQ) Water Availability Division's Groundwater Planning and Assessment Team (GPAT) has been performing immunoassay (IA) screening of water samples since 1994. IA benefits include:

- Quick – 50 samples can be analyzed for one contaminant in 1.5 hours;
- Inexpensive – about $300 for 80 – 100 samples;
- Low sample volumes – 200 – 250 µl per analysis from a 40 ml vial;
- Various contaminants – pesticides, PHCs, PCBs, etc.; and,
- Low detection levels – e.g., 0.1 ppb for atrazine pesticide.

The IA method applies the principle of enzyme-linked immunosorbent assay (ELISA) – assisted by a magnetic field, high selectivity is achieved through the discriminatory capability of antibodies and the catalytic ability of enzymes. Reference websites include http://www.modernwater.com/monitoring/environment/ and http://www.abraxiskits.com/products/pesticides/.

The IA method can be used:

- On groundwater or surface water samples (soil analyses also possible);
- To investigation monitoring and plume delineation in the field;
- In combination with cooperative monitoring; and,
- For a large number of samples in order to reduce the number of samples subsequently submitted for more costly laboratory analyses.

History of IA Screening at TCEQ:

- TCEQ has been conducting cooperative monitoring of groundwater with the Texas Water Development Board since 2000. As of March 2016, TCEQ has performed over 320,800 IA analyses on over 14,300 samples from over 6,600 wells.
- Additional cooperators have included other program areas within TCEQ, Groundwater Conservation Districts, public water supply systems, and the United States Geological Survey.
- Through investigative work at one site, IA screening of monitoring wells within the Leaking Petroleum Storage Tank program help identify facilities that have not always met their quarterly monitoring requirements.
- The most recent cooperation was with the TCEQ Superfund program, which involved the GPAT staff conducting IA screening for atrazine on samples collected by the Superfund sampling contractor; this enabled the analysis of additional well samples to indicate the extent of atrazine detections in several areas in the Panhandle Region.

Benefits of IA Screening at TCEQ:

- By working with existing monitoring programs, various areas have cooperated in accomplishing more sampling and analyses using existing instruments, in less time, and with minimal or no additional expenses.
- Awareness of other program data needs provides the opportunity to share existing data and possibly identify new areas of concern or prevent duplication of efforts.
- IA screening can be a more effective and efficient use of funds, resources, and expertise through communication and cooperation, which is especially important in a time of budgetary concerns.

GPAT staff can run a limited number of atrazine samples during routine work, loan out equipment, or advise a program area considering this method for an on-going project (as time and resources allow). For questions, or to set up a demonstration, contact Al Cherepon at alan.cherepon@tceq.texas.gov and 512-239-4509.