RAPID TOXICITY ASSESSMENT OF PRIVATE WELLS NEAR NATURAL GAS EXTRACTION, HYDRAULIC FRACTURING SITES, EARNS JOURNAL OF CHEMISTRY PUBLICATION

Carlsbad, California, June 1, 2015 – Authors of the paper titled "*Rapid Analysis of Eukaryotic Bioluminescence to Assess Potential Groundwater Contamination Events*," received notification that the Journal of Chemistry will publish their work on the analysis of water from private wells in the Barnett Shale area near Dallas, Texas, the location of significant natural gas extraction and hydraulic fracturing. In the research paper, field derived data from Assure Controls' QwikLite Biosensor System is shown against laboratory analytical data on the same samples.

In the study of over 100 private wells, test kits containing *Pyrocystis lunula*, a bioluminescent dinoflagellate, were used to rapidly assess potential instances of groundwater contamination. *P. lunula* bioluminescence can be quantified using spectrophotometry as a measurement of organismal viability, with normal bioluminescent output declining with increasing concentration(s) of aqueous toxicants.

The study showed that Glutaraldehyde and hydrochloric acid (HCl), components used in hydraulic fracturing and shale acidization, triggered significant toxicological responses in as little as 4h. Conversely, *P.lunula* was not affected by the presence of arsenic, selenium, barium, and strontium, naturally occurring heavy metal ions potentially associated with unconventional drilling activities. Therefore, if exogenous compounds, such as glutaraldehyde and HCl, are thought to have been introduced into groundwater, quantification of *P. lunula* bioluminescence after exposure to water samples can serve as a cost-effective detection and risk assessment tool to rapidly assess the impact of putative contamination events attributed to unconventional drilling activity.

The data show that the QwikLite algal bioluminescence test is rapid, cost-efficient, and sensitive to some compounds commonly associated with hydraulic fracturing. QwikLite may best be utilized as a preliminary screening and risk assessment tool, assessing putative groundwater contamination events in as little as 4 hours. If initial results indicate potential contamination, a larger suite of focused analytical chemistry analyses could follow.

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