
What are the Impacts of a Dense Field of Septic Systems on Groundwater Quality?

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ABSTRACT

This was initiated to address public concerns about the chemicals present within the fracturing solution to be used in development of an unconventional hydrocarbon deposit in southeastern Louisiana as a possible source of contamination of their drinking water. Establishment of baseline water quality by testing existing residential water wells was done prior to fracing and revealed significant variability of water quality. This variability maybe due to residential septic system density as apparent between areas with average lot sizes of about 0.5 acres to those over 1.5 acres.

Samples were collected from 100 domestic water supply wells mainly screened across a shallow sand that is less than 300 feet below the surface. Each sample was analyzed for the following ions and compounds: arsenic, benzene, boron, bromide, butane, cadmium, calcium, chloride, chromium, copper, ethane, ethylbenzene, fluoride, iron, lead, magnesium, manganese, methane, nickel, nitrate, nitrite, pentane, pH, phosphate, phosphorous, potassium, propane, silicon, sodium, specific conductance, strontium, sulfate, toluene, xylenes, zinc, and total dissolved solids (TDS).

Within the study area is a subdivision that can be split into residential developments of two different densities, which contained approximately half of all of the study's wells. The southern half of the development has lots typically between 1.5 and 2.5 acres. The northern half of the development has lots typically less than 0.5 acres. Results are such that the septic system density appears to influence ion concentrations. Ground water concentrations of aluminum, barium, bromide, calcium, chloride, copper, iron, magnesium, manganese, methane, nitrate, phosphorous, potassium, sodium, strontium ions, and TDS are significantly higher for the more-dense portion of the subdivision than for the lower density portion of the subdivision.