

Baseline Geological and Geochemical Near Surface Data – The case of the Utica Shale in Southern Quebec

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Abstract

Shale gas and tight oil exploration and development in populated areas with little past experience with the hydrocarbon industry is usually met with some strong opposition most of which is based on the perception of risk for groundwater quality. The industry and the public geoscience organizations are responsible for evaluating and monitoring the environmental impacts of unconventional resources development. The Geological Survey of Canada has initiated a detailed evaluation of shallow sub-surface conditions (geology, hydrogeology, geochemistry) at a specific site southwest of Quebec City where one shale gas well targeting the Utica Shale has been drilled and fracked. Soil gas, dissolved hydrocarbons in groundwater and organic geochemistry of extracts from shallow cores have been analysed for the origin of the gas. Preliminary groundwater data suggest a mixed biogenic and thermogenic origin for the gas (C1 to C3), and GC and GC-MS of the extracts document up to C20 hydrocarbons in the shallow bedrock. The establishment of baseline geological and hydrogeological settings is a critical first step prior to large scale development of unconventional hydrocarbons.