

Use of Hydrogeologic Principals and a Comprehensive Integrated GIS Geodatabase to Rapidly Assess/Screen the Risk Posed by SCVF/GM

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Surface Casing Vent Flow (SCVF) and Gas Migration (GM) may be the first sign of wellbore integrity problems that may have the potential to cause environmental impact to various subsurface and surface environmental receptors. Understanding risk related to SCVF/GM requires some understanding of the source (wellbore environment), exposure pathways (wellbore, aquifers, surface water features) and receptors (aquifers, water wells, aquatics, and terrestrial features). A leaky well casing with no nearby environmental receptor poses considerably less risk, and would be mitigated differently, than would a similar leaky well located near a receptor. One of the most challenging aspects is with the assessment of the subsurface pathway/receptor environment where a detailed understanding of hydrogeology is essential. Such challenges can be overcome through the use of web-enabled geodatabase tool that combines hydrogeology/environmental data with energy well data for use in screening risks/hazard relating to known well/areas of SCVF/GM. The approach utilizes existing data to assist in prioritizing mitigation of leaky wellbores in a cost-effective manner.

The presentation will demonstrate the use of the geodatabase that allows for the rapid filtering/assessing/screening of risk related to a SCVF/GM event in the context of the local risk-related parameter data. This includes topographic/geographic setting data, energy well data, reported loss of circulation issues or drilling problems, water well data and users, geologic/hydrogeologic data, aquifer mapping, environment/spills records, serious and non-serious SCVF, GM data, etc. The screening tools can be applied to a single well bore or to an entire asset. The geodatabase can also be used to identify aquifers for drilling and completion source water needs.

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Mr. Jamie Wills is president and co-founder of Waterline, an Alberta and BC-based hydrogeology and environmental consulting firm. His almost 30 years of experience have focussed on the energy sector in western Canada. Jamie has a graduate degree in hydrogeology from the University of Waterloo, and he is a past-President of the Canadian Chapter of the International Association of Hydrogeologists. He is the chair of the newly formed Hydrogeology Division of the CSPG, and has presented and chaired at numerous conferences over the last two decades.