

VERIFICATION OF BTEX AS PRINCIPAL TOXIC VOLATILE COMPONENTS IN GROUND WATER AT SOUR-GAS PLANTS – A TOXICITY IDENTIFICATION EVALUATION APPROACH

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ABSTRACT

A toxicity identification evaluation approach is evaluated for experiments conducted to assess the quality of ground water samples collected from 6 gas plants in Western Canada. The gas plants were selected as being typical of plants currently in operation and to represent a cross-section of hydrogeological conditions and of sweetening processes in use. Focus was placed on the levels of volatile organics, particularly BTEX hydrocarbons. Toxicity tests included: bacterial luminescence (Microtox), daphnia mortality, fathead minnow mortality and lettuce seedling emergence. For the toxicity tests, sample handling procedures were required which minimised the loss of volatile organics. The toxicity of the ground water, was in general, well correlated to the concentration of BTEX. Approximately 5% of the samples, however, were observed to be toxic although the concentration of BTEX were below the analytical method detection limit of 1µg/l. In these samples, thiophenic volatile organics were implicated. Based on the laboratory results, the remediation of BTEX is expected to correlate well with the removal of the toxicity in ground water at the sour-gas plants.