Application of an Innovative AEM System for Mapping Hazards and Water Resources in Oil and Gas Fields

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Abstract

Mira Geoscience has collaborated with SkyTEM Canada Inc.to produce this case study using public Airborne Electromagnetic (AEM) data collected by Geoscience BC in partnership with members of the Horn River Basin Producers Group. The objective of the AEM survey at the outset was to delineate possible sources of near surface groundwater thought to be contained in quaternary paleochanels. Modelling and interpretation of the data has resulted in imaging of subsurface resistivity features thought to represent these paleochannels. Throughout the course of the project other applications of the dataset have become apparent during the interpretive process. These applications include: detection of shallow gas and structures that may confine gas in the near surface (clay caps), explanation of artesian water in hole d-66-f and prediction of further artesian water flow throughout the property, and detection of near surface coarse materials for engineering applications such as road and drill pad construction. The case study illustrates the interpretive power of combining AEM models with seismic interpretation as well as the advantages that low noise and high resolution multi moment airborne electromagnetic data acquisition systems and advanced EM processing bring to the interpretive process.