

## **Acquiring Seismic Data in the Sahtu Region of the Northwest Territories of Canada: Operational Challenges and Potential Solutions**

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Several significant hydrocarbon fields have been discovered in the past three decades within the Sahtu Region of the Northwest Territories of Canada. These fields are located in proximity to the proposed Mackenzie Valley Gas Pipeline. Potential reservoirs along the pipeline route include Basal Cambrian sandstones trapped in fault bounded structural closures and Devonian reefal carbonates. Future field mapping and development and identification of additional prospects and leads will require the use of cost-effective, environmentally friendly, state of the art seismic acquisition. The Sahtu Region is a vast area of highly variable topography. Acquiring seismic data across this isolated, remote expanse of terrain provides a unique set of operational, logistical and technical challenges. Operationally seismic acquisition within the region, both the summer and winter, requires the utilization of equipment ranging from large tracked vehicles to fixed wing aircraft to lightweight heli-portable equipment with crew accommodation ranging from sleigh camps to private homes in small communities. From a technical standpoint, recent advances in digital 3-component seismic acquisition systems have given operators greater flexibility and control in the designing and recording of surveys within the region. A comparison of results from two separate digital 3-C acquisition projects will be presented. One of these was acquired using a dynamite source, the other with vibroseis, and one line was acquired with both dynamite and vibroseis sources. The high standard for consultation with local communities established by the regulators within the Sahtu settled aboriginal land claim area results in a high degree of interaction and collaboration with local aboriginal communities. Additionally, the development of regulatory mandated project-specific environmental protection plans results in a high degree of scrutiny and oversight by regulators and the local communities for a multitude of operational modalities. This paper will compare the results from two separate digital 3-C acquisition projects. One of these was acquired using a dynamite source, the other with vibroseis, and one line was acquired with both dynamite and vibroseis sources. We will also discuss how several important technical advances in the environmental planning and monitoring both pre acquisition and during the acquisition stages resulted in significant costs savings, better community relations and smoother data acquisition