

## **Customized Geographic Information Systems Used to Acquire Baseline and Monitoring Data, Identify Gas Seeps, Protect Unconventional Resource Assets, and Comply with the New Colorado Oil & Gas Conservation Commission Rules**

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The new Colorado Oil and Gas Conservation Commission (COGCC) rules require baseline assessments and monitoring of coal-bed methane (CBM) and other development projects. The rules also recommend that operators create a Comprehensive Drilling Plan for larger drilling projects, which exempts the operator from the Form 2A requirement on each individual well drilled. Under COGCC Rule 608, CBM programs now have special requirements for baseline assessment and monitoring. Risk associated with nearby conventional or plugged and abandoned wells must be assessed by soil-gas surveys, domestic water well sampling and testing prior to drilling, and post-drilling monitoring. Where the CBM-bearing formations outcrop or coal mines exist within two miles of a proposed well, natural gas seeps must be investigated and monitored at the outcrop. Current interpretations of these rules will be discussed.

COGCC Rule 216 requests that operators “initiate and enter into a Comprehensive Drilling Plan...” on a voluntary basis. This Comprehensive Drilling Plan will include infrastructure, geographic, wildlife and environmental attributes of the project area. It would address specific issues normally included in the Form 2A, Oil and Gas Location Assessment, and can exempt the operator from filing Form 2A for each well.

Data is collected to evaluate environmental baseline conditions prior to development of CBM and other unconventional oil and gas resources. A new field data acquisition system was developed using customized Geographic Information System (GIS) software. Field data is entered directly into a geodatabase on a PDA/GPS unit on the fly. The system eliminates many errors associated with manual field- data collection and data entry, increasing efficiency. The combined geodatabase can include many features such as interpreted air-photo anomalies, topographic maps, natural gas seep locations and extent, stressed vegetation, springs, water wells, laboratory data, surface water features, existing oil/gas infrastructure, encountered leaks, ambient air methane readings, and anthropogenic disturbances. Shapes of these many features are mapped in the field without the need to collect abundant single point data, sketches, and notes in order to manually re-map features later. Collection of gas-seep data using sensitive and proper field instrumentation is also essential to making the data collection system efficient and accurate, protecting the owner of the assets. Conducting these surveys prior to development protects operators from later accusations of conditions that were actually pre-existing. The monitoring program helps locate issues (such as casing leaks, gas in water wells) as soon as possible enabling quicker and less expensive solutions and repairs.