SPECTRAL EVOLUTION

Identifying Methane in Soil

Methane in soil can be an indicator of the presence of hydrocarbons and reservoirs of natural gas and oil. It can also indicate leaks and spillage along pipelines and storage facilities. Traditional testing for methane in soil is costly and time consuming.

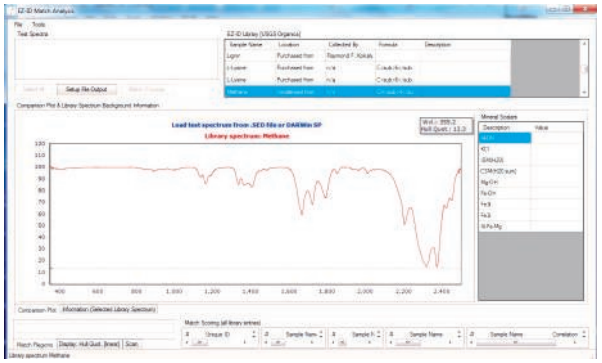
SPECTRAL EVOLUTION field spectroradiometers and spectrometers are simple, non-destructive, reliable, fast and accurate for methane in soil measurements.

Field testing provides an affordable alternative. NIR reflectance spectroscopy can be used to identify methane in soil. Spectral Evolution offers a range of field spectroradiometers including the SR-6500, RS-8800, RS-5400, PSR+, and RS-3500. These instruments cover the full spectral range from 350-2500 nanometers in rugged, lightweight units with no moving optical components for reliable field operation. Spectra of soils with methane show characteristic absorption features at 1180 and 1380 nanometers and from 1680-1720 and 2300-2450 nanometers. Different algorithms, modeling and chemometric techniques can be used to manipulate the spectral data acquired and build a library of known samples for comparison with new targets.

For ultra high resolution and high sensitivity spectra, the SR-6500 is unmatched among field units. The SR-6500 delivers the following resolution:

- 1.5nm @ 700nm
- 3.0nm @ 1500nm
- 3.8nm @ 2100nm

The SR-6500 can be used with our Miniprobe to scan soil samples and identify minerals, especially clays and carbonates, in soil samples. Mineral identification is fast, easy and accurate with our optional EZ-ID software and three mineral spectral libraries . There is a sample methane spectra included in the USGS library for target matching.



SPECTRAL EVOLUTION's optional EZ-ID software provides access to there mineral spectral libraries including the USGS library where a methane sample scan is available.

In addition to soil analysis, the effects of methane in soil can also be indicated by changes in the red edge spectra of vegetation. The SR-6500 can be used for stand-off scanning of vegetation with a Field of View (FOV) lens or our unique leaf clip. The loss of chlorophyll in vegetation can be an indicator of methane microseepage.

Our field spectroradiometers provide:

- Spectral range 350-2500nm
- Reliable one-touch operation with autoshutter, autoexposure and auto-dark correction before each new scan – no optimization step required
- Small and lightweight with rechargeable lithium-ion batteries
- Superior signal-to-noise ratio: faster scan times and better reflectance measurement
- Single user operation with optional rugged handheld tablet that provides a sunlight readable display plus the ability to tag spectra with GPS, digital images, and audio notes
- DARWin SP Data Acquisition software for ease-of-use – automatically saves files in ASCII format for use with 3rd party software – no pre- processing necessary
- Optional EZ-ID mineral identification software with Custom Library Builder module to build your own library for regression analysis

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