

Overview

Surficial soil surveys analyzed for inorganic elements have proven to be a useful predictive geochemistry in determining the location of deeply buried exploration targets. Organic components have also been sited as a potentially useful geochemical tool. In the last ten years, our research has been conducted to study and improve upon the use of organic compounds as a geochemical exploration tool

Bacteria that leach and metabolize compounds from mineral deposits or petroleum plays at depth eventually release hydrocarbons that migrate to the surface. Surficial samples such as soil, sediments, peat, humus, etc., act as collectors of these hydrocarbons. Past researchers have used very volatile compounds in the C1 to C4 carbon series range, and have also hypothesized the use of heavier hydrocarbons. Our research has resulted in a geochemistry, defined as Soil Gas Hydrocarbons (SGH), which extracts the organic compounds absorbed on the surface of B-Horizon soil samples specifically for the heavier organic compounds in the C5 to C17 carbon series range. These compounds may migrate from depth in a volatile form but are not gaseous at ambient temperature and pressure.

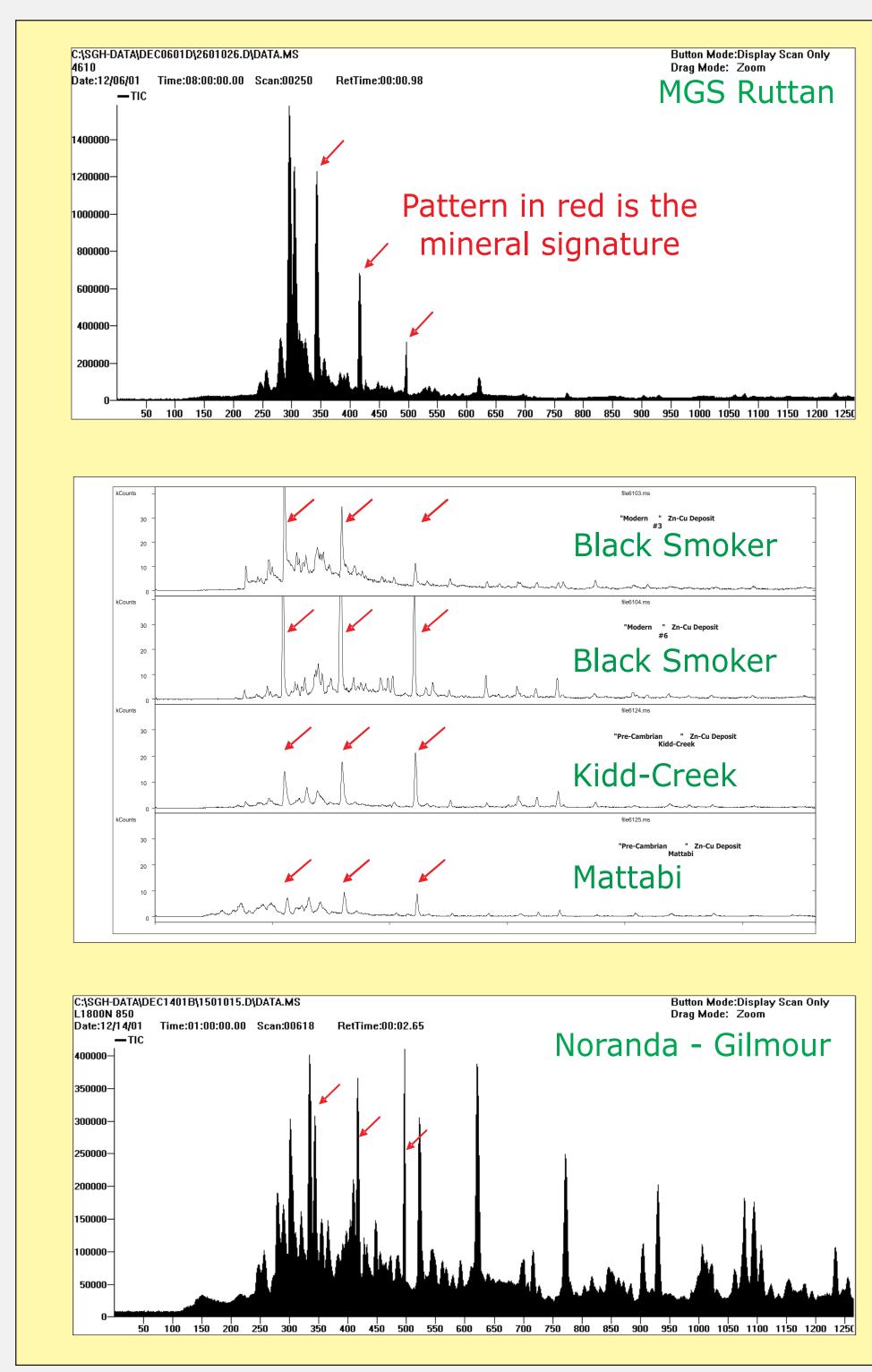
The SGH technique analyzes each sample for over 160 specific hydrocarbons at a detection limit of one part-per-trillion (ppt) now proven to be the remnants of these bacterial actions. The data was reviewed forensically resulting in specific combinations and ratios of the hydrocarbons monitored which defined different organic signatures found to be directly related to the target. The surficial geochromatographic dispersion of these organic compounds has also been researched and found to be able to vector to the location of buried exploration targets. SGH is thus a dual purpose deep penetrating predictive geochemistry that both locates and identifies the type of target that may be present.

The SGH geochemical signature has been demonstrated at successfully locating mineral targets at depths of up to 700 metres and has identified targets of Uranium, Gold, SEDEX, VMS, Nickel, Copper, Kimberlite formations and Petroleum plays from actual surveys.

SGH is a dual purpose method that can locate a buried target as well as identify the type of target present. A pattern recognition approach to the data has resulted in defining specific SGH signatures for various types of targets. The SGH signatures in surveys over Gold, Nickel, VMS, SEDEX, Uranium and Copper as well as Kimberlite Pipe targets have been extensively studied.

Cutting Edge Geochemistry Detects Organic Signatures in Surficial Samples Originating from Bacterial-Mineral Interactions to Locate and Identify Deeply Buried Exploration Targets

Background



What does an SGH signature look like?

This SGH *soil* sample signature contains a "visible" portion of the buried VMS target signature.

Consistent SGH target signatures.

Similar signatures are in the ore as in these VMS rock specimen samples from different locations and of various ages.

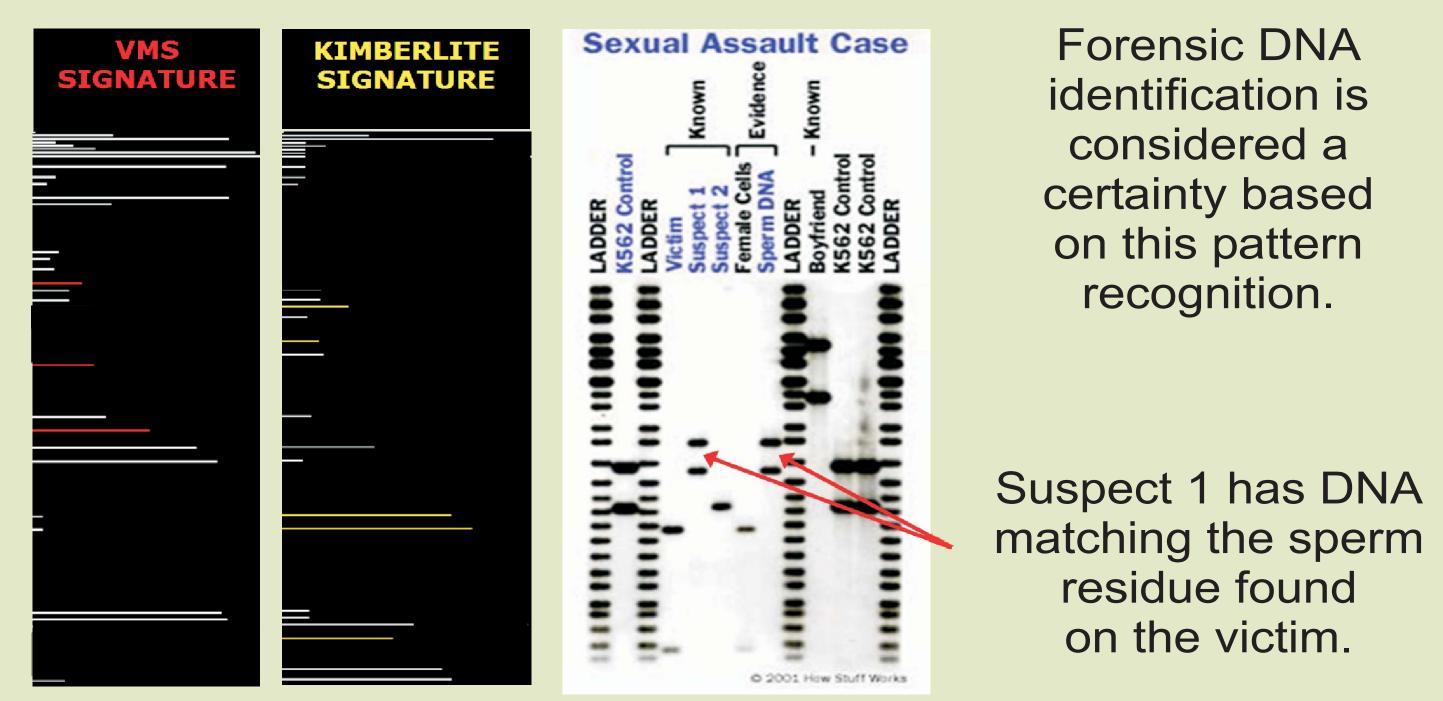
SGH target, different location

Another SGH *soil* sample signature that contains a "visible" portion of the buried VMS target signature.

FORENSIC PATTERN RECOGNITION APPROACH

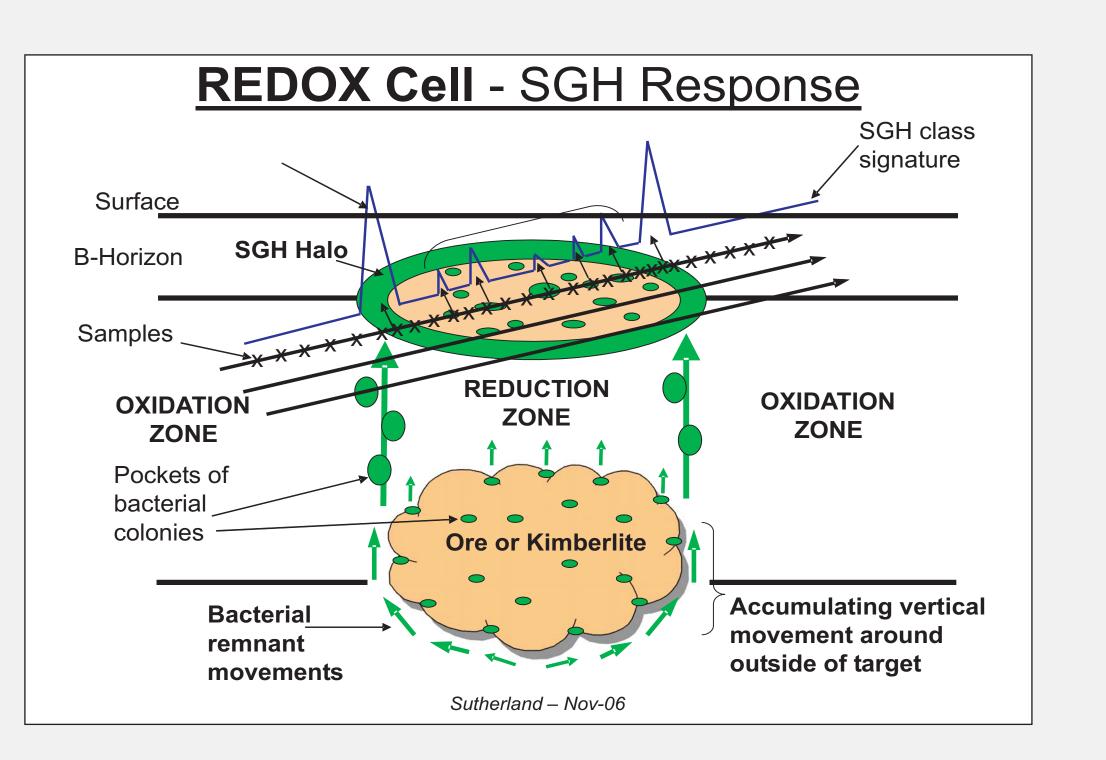
As a Forensic-type of identification, SGH provides high confidence by using 162 parameters for pattern recognition.

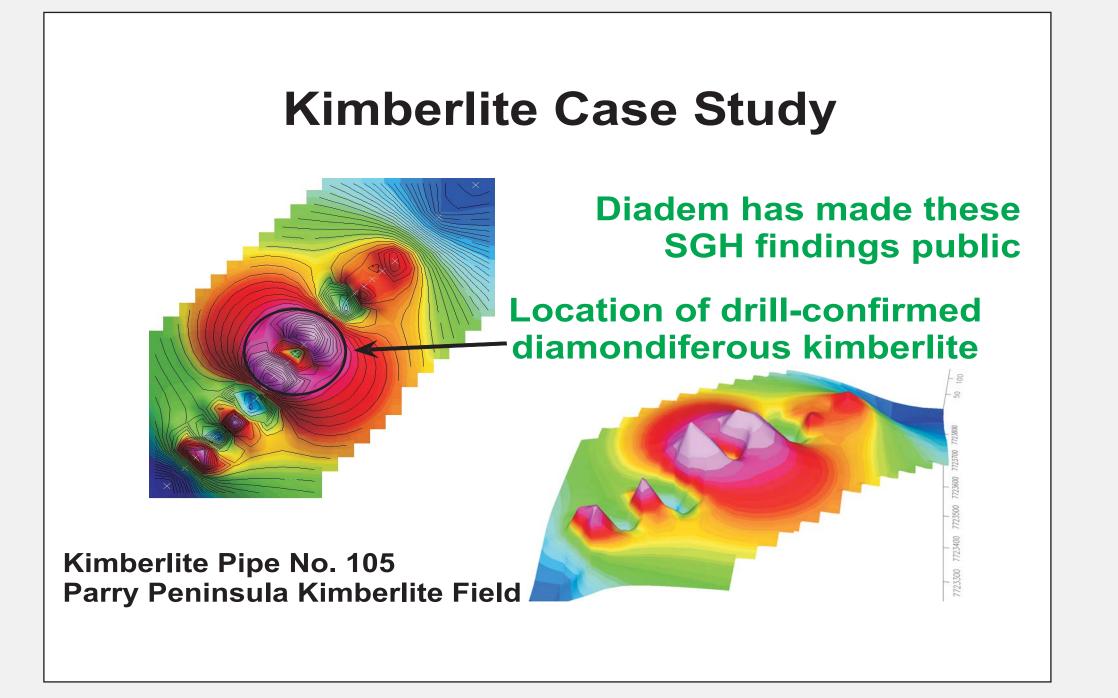
SGH has a different signature for VMS (shown in red) than that of a kimberlite (shown in yellow).

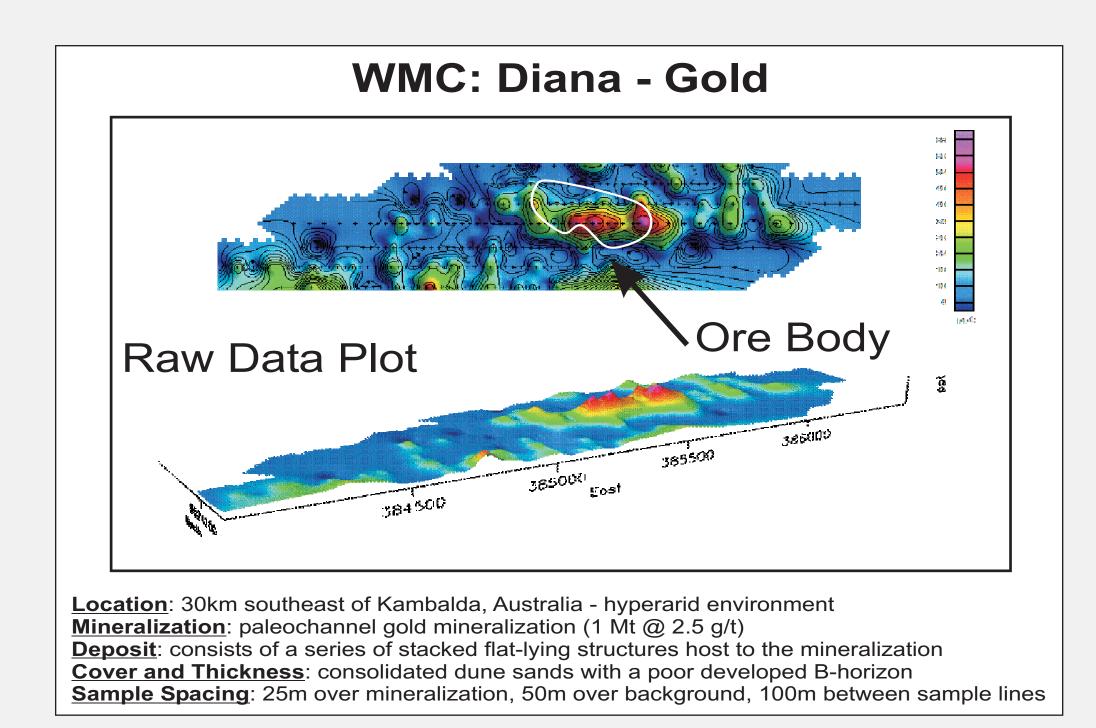


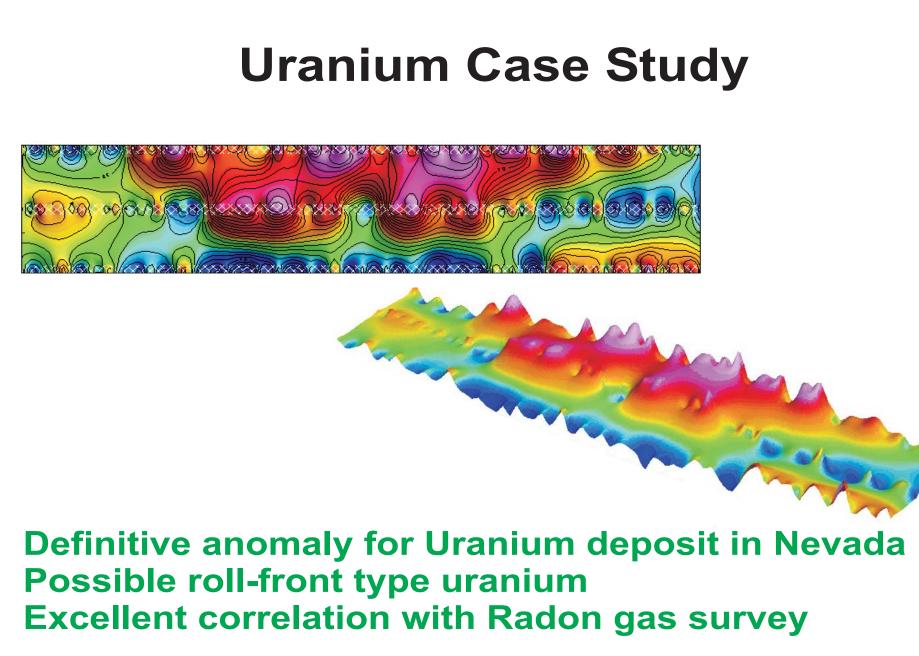
Case Studies

Several deposit types (lode Au, magmatic Cu-Ni, porphry Cu, skarn Cu, U, VMS, diamond) and environments (glaciated to arid) have been the subject of SGH survey studies.

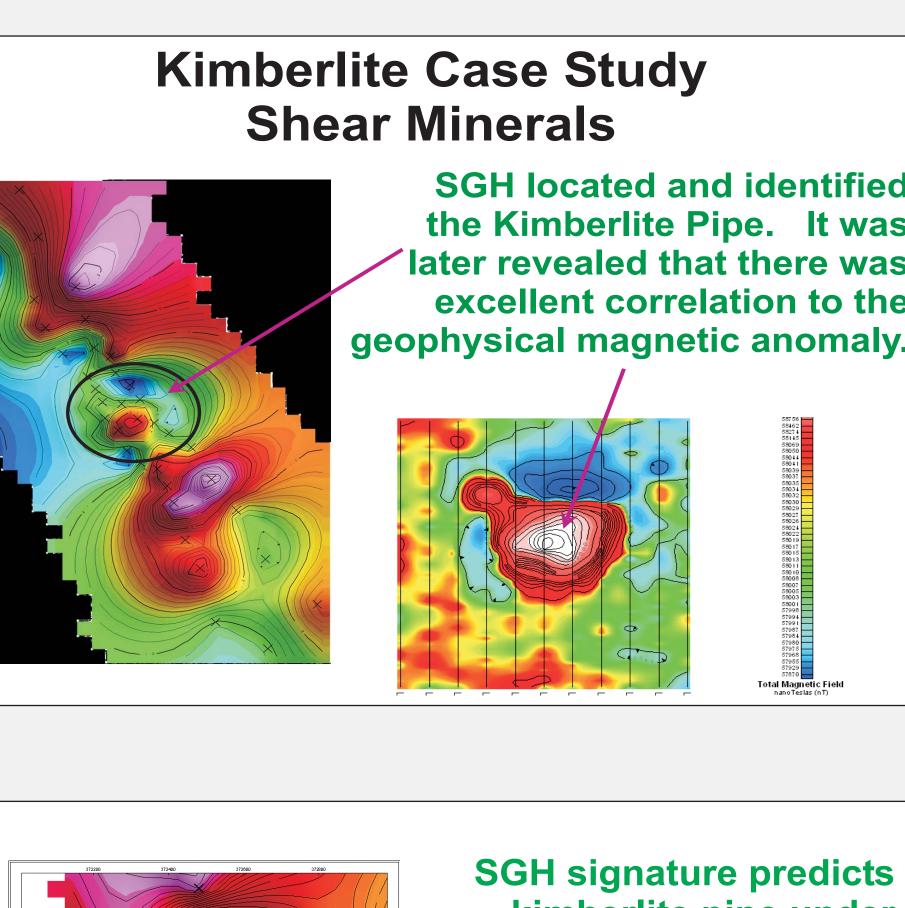












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