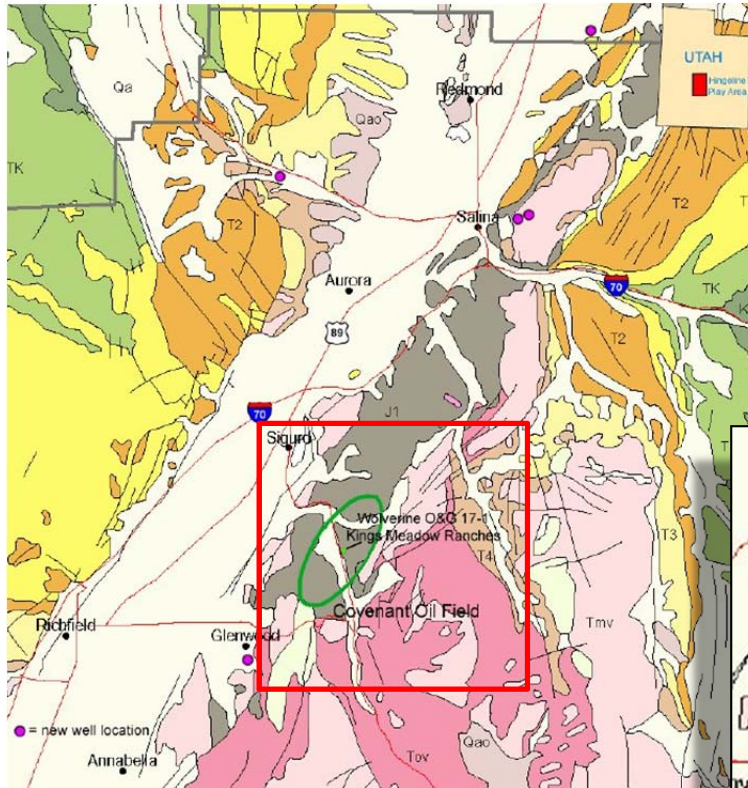


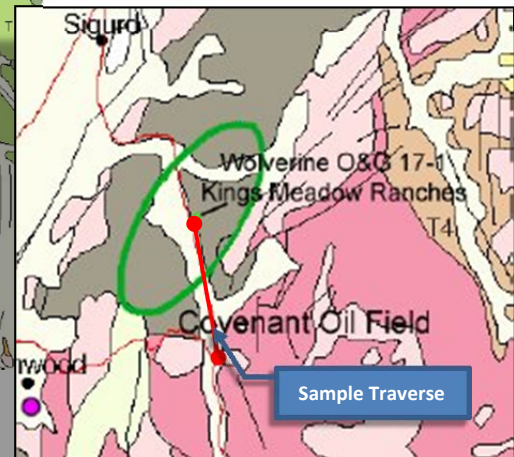
Covenant Field Analog

Sevier County, Utah

Surface geology of the Covenant Field Area



Geochemical sample traverse from south to north and terminating at the Wolverine O&G 17-1 well.



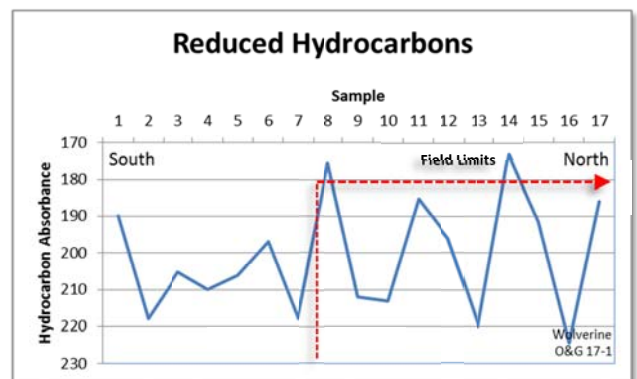
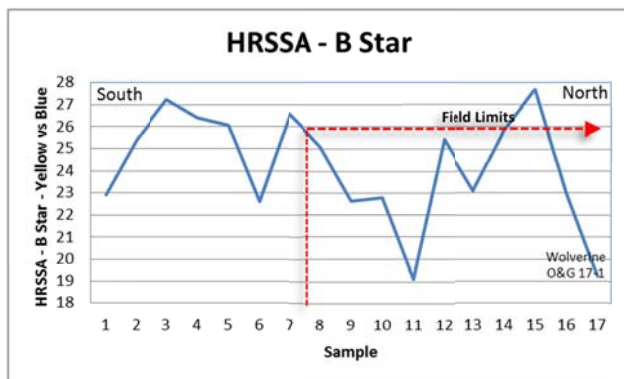
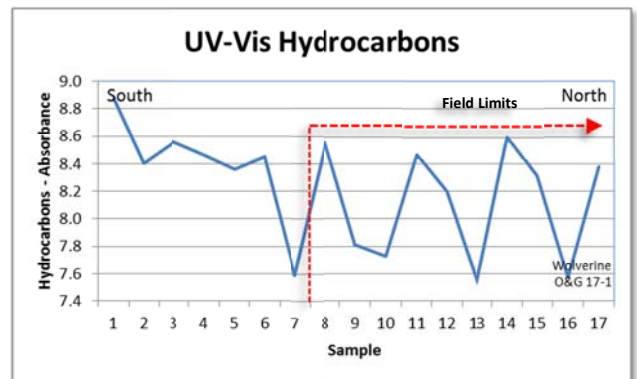
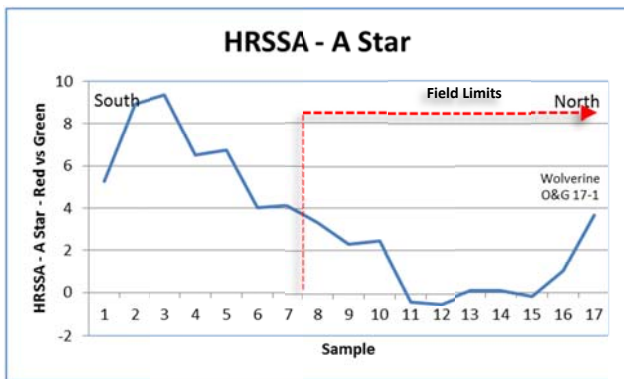
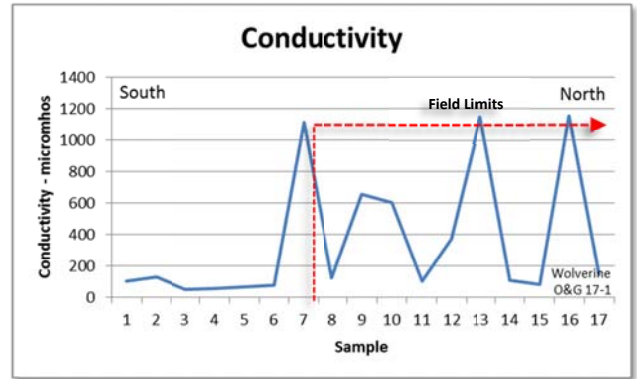
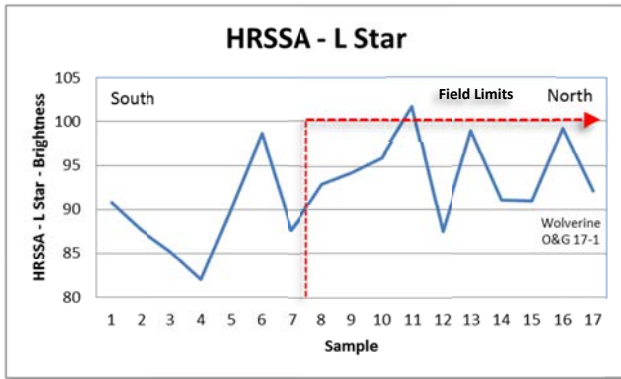
After over 50 years of exploration in the central Utah thrust belt, or “Hingeline,” the 2004 discovery of Covenant oil field proved that this region contains the right components (trap, reservoir, seal, source, and migration history) for large accumulations of oil. To date, 10 producing wells and one dry hole have been drilled from two surface pads. Covenant has produced over 2 million bbls of oil and no gas; the field averages 6400 BOPD.

The Covenant trap is an elongate, symmetric, northeast-trending anticline, with nearly 800 ft of structural closure and bounded on the east by a series of splay thrusts in a passive roof duplex. The eolian Jurassic Navajo Sandstone reservoir is effectively sealed by mudstone and evaporites in the overlying Jurassic Twin Creek Limestone and Arapien Shale. Oil analysis indicates a probable Mississippian source – oil derived and migrated from rocks within the Hingeline region.

Cores from the Navajo Sandstone display a variety of eolian facies (dune, interdune, lake/playa, fluvial/wadi), fracturing, and minor faults which, in combination, create reservoir heterogeneity. Reservoir sandstone is 97% frosted quartz grains (bimodal grain size), with some quartz overgrowths and illite. The net reservoir thickness is 424 ft over a 1600-ac area. Porosity averages 12%; permeability is 100 mD. The drive mechanism is a strong water drive; water saturation is 38%.

Covenant Field Analog

Sevier County, Utah



The sample traverses are data from Covenant Oil Field (see the attached map). L Star, A Star, and B Star are results from a CIE Lab spectrophotometric color analysis. L Star is inversely related to A Star and B Star. All three variables yield a halo signature. The spikes represent surface expressions of faults that act as conduits for hydrocarbons travelling from the reservoir and finally deposited as altered soil organic matter. Conductivity is a measure of inorganic and organic salts precipitated from biological processing of altered soil organic matter. The spikey nature of the data reveals the areas geological complexity. The UV-Vis and Reduced Hydrocarbons are non-gas phase hydrocarbon detection methods. The UV-Vis hydrocarbons measure the water soluble fulvic acids of the altered soil organic matter. The Reduced Hydrocarbons measure the reduced form of Ketones, yielding a color change when catalyzed by copper. Both methods exhibit a halo signature.