

Discoveries must have “significant quantities”



Steve Phillips

Steve Phillips, head of Ryder Scott G&G, presented “The Significance of Significant or Just Give Me a Number” at the Ryder Scott annual webinar.

The title differentiates between “significant” accumulations (justified discoveries) and not so significant — those not on a pathway to reserves.

“It takes experienced judgement to discriminate between minor or background hydrocarbon occurrences and deposits with commercial potential that are ‘significant,’” said Phillips.

Misused terminology in public statements can confuse. In one example, a company touted an exploration project with a hyped-up press release, pointing out an “astonishing thickness of reserves.”

Later, the company disclosed it found no traces of oil and discontinued the operations.

Phillips expanded on the principles-based definition of “discovery” in the 2018 PRMS guidelines. Central to this definition is that a discovery has to have a “significant quantity of potentially recoverable hydrocarbons.”

“Many exploration geologists have heard or said something to the effect that finding a ‘teacup’ of oil counts as a discovery,” said Phillips. “This adage contradicts the PRMS guidance that the ‘chance of geologic discovery’ must anticipate the ‘chance of development,’ which is key to the overall goal of commerciality.”

The definition leaves lots of room for misleading non-technical stakeholders and the public.

“The PRMS guides honest reporting of exploration project results,” said Phillips. “This is one area where our ongoing commitment to ethics must lead the way for the technical work and public disclosures.”

Why we fool ourselves

Some detectable levels of hydrocarbon concentration can be widespread in the subsurface, Phillips noted. In some wells, gas chromatography from mud logging may indicate thick intervals with trace levels of methane (denoted as C1) in a given sedimentary basin.



Surface geochemical prospecting may indicate the same.

“Thermal and biological generation and migration processes can be active over large areas,” said Phillips. “However, concentration of hydrocarbons in conventional and unconventional reservoirs with commercial potential require favorable, relatively localized conditions.”

He clarified what constitutes a discovery through four examples of non-discoveries. Pitfalls included no gas to surface, low recovery of oil, no traces of claimed oil, and misleading terminology that sidesteps commerciality.

All four cases are summarized in the **presentation slides**.

In looking at the mining sector as a parallel for the oil industry, Phillips noted that metal ore deposits are generally assumed to require a certain concentration above the average background levels in the earth’s crust.

“However, this alone does not make a deposit significant,” said Phillips.

He cited the textbook, “Physical Geology”, by **Steven Earle**, who writes, “It’s important to note that the economic viability of any deposit depends on a wide range of factors including its grade, size, shape, depth below the surface, and proximity to infrastructure, current price of the metal, the labor and environmental regulations in the area, and many other factors.”

As in hard rock mining, no single petroleum reservoir factor can predict commerciality.

Phillips provided examples from a Ryder Scott internal database, stating, “The range of potentially commercial reservoir characteristics is very wide and careful technical analysis must be combined with thoughtful application of resource definitions.”

For instance, the same quantity that might be significant in one case, say a shallow onshore reservoir near infrastructure, might be far from sufficient in a remote deep water play.

Exploration wells are typically drilled with hopes that the upside or, at least, the mean-case outcome will be realized.

Phillips asked, “How often are internal standards for minimum thresholds of key reservoir properties defined in advance of the project?”

He recommended consideration of exploratory well operations as an indicator of discovery status. In simple terms, data generated by a well must demonstrate that an in-place quantity of petroleum can be reliably estimated and has real potential for commercial recovery.



In looking at the mining sector as a parallel for the oil industry, Phillips noted that metal ore deposits are generally assumed to require a certain concentration above the average background levels in the earth’s crust. The Morenci deposit, discovered in 1856, initially exploited high concentration metal ores by subsurface mining. Eventually, open pit mining was implemented to recover ore with copper concentration below 0.3 percent. For commercial exploitation, copper deposits typically need to exceed 0.5 percent and preferably, meet a 2-percent threshold. The lesson is that multiple factors contribute to commerciality.

Ryder Scott is certified in ISO 9001 and 14001 standards

When the auditor becomes the audited

Ryder Scott received independent certifications that it meets ISO 9001:2015 and ISO 14001 standards. The International Organization for Standardization (ISO) sets the requirements.



ISO 9001:2015 defines quality management systems (QMSs) based on documented procedures. ISO introduced 9001 in 1987. ISO 9001:2015

further defined the requirements for a QMS.

To earn and maintain ISO 9001:2015 active status, a company must show sustainable, continuous improvement of the quality of its products, processes and services.

ISO 14001 defines pre-requisites for environmental management systems (EMSs). It does not address environmental performance. Instead, it maps out a framework that a company can follow to set up an effective EMS.



The requirements of ISO 14001, which meet European Union standards, set a higher bar for performance improvement, legal compliance and reporting duties.

Third-party inspectors conduct surveillance audits of certified companies in years one and two after the initial certification. The third year requires a recertification audit to maintain status. Years one and two after the recertification are subject to more surveillance audits.

Dekra was the independent auditor and certifier for Ryder Scott.

Dekra calls itself, “... the world’s largest, unlisted, expert organization in the testing, inspection, certification industry.” It is the largest inspection company in Germany.

Certifications demonstrate a company is compliant with other standards around the world.

“This took over a year of hard work and dedication to become certified,” said **Dean Rietz**, CEO. “We had to create the necessary guidelines and policies to navigate through the certification process. I would like to highlight and thank **Herman Acuña**, executive vice president, for his efforts and oversight to make this happen.”