Managing Wellsite Operations, Safety Leadership, Risk Assessment

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Introduction:

This course provides a complete overview of wellsite operations from the perspective of the Operations Geologist and the Wellsite Geologist. The focus is on being able to understand the job functions that are typically performed at the wellsite, and what use is made of the large amounts of data collected. The course will also provide an overview of essential drilling operations that have a direct bearing on these discliplines.

Wellsite geologists study rock cuttings from oil and gas wells to determine what rock formations are being drilled into and how drilling should proceed. They identify critical strata from core samples and rock-cutting data and build up knowledge of the structure being drilled. They are experienced geologists, deciding when specialized tests should be carried out and, ultimately, when to stop drilling. They send reports and logs of completed drilling to the operations geologist and offer geological advice to oil company representatives. They also incorporate health and safety requirements in daily geological operations. Wellsite geologists also liaise with drilling engineers, petroleum engineers and mudloggers during the course of projects.

Participants will learn the techniques used by wellsite geologists in formation evaluation through a combination of lectures and exercises that can typically be done at the wellsite. At the end of the course, the participants should have a good understanding and knowledge of the requirements of both Operations and Wellsite Geology.

The course will blend classroom instruction with several practical exercise sessions. If location permits, a visit to a wellsite can be arranged.

Who should attend?

E&P staff who want to learn the functions that are performed by Geologists at the wellsite.

Course Outline:

Day 1

- Introduction
- What is an Operations and Wellsite Geologist?
- Exploration and Drilling Programs – Risk assessment, regional analysis, pre-drill data acquisition.
- Components of a prospect
- Overview of Petroleum Geology
- The Petroleum system – elements & processes
- The Reservoir – Sedimentary Environments
- The Trap – Structure & Stratigraphy
- Mapping and Cross-Sections

- Pore Systems and Flow Units
- Reserves and Resources – classification and categories
- Data Types and Management
- Wireline Data – open and cased hole, testing, LWD and MWD

- Mud Logging Data – geological, drilling, pressure
- Core Data – whole core and sidewall core

Day 2

- Drilling Operations
- The drilling team – who does what?
- Types of Drilling rigs
- Rig Sub-systems – power, hoisting, rotary, circulating, well control
- Drilling tools and components – including drilling fluid
- Well control – kicks causes – basic calculations – safety equipment – kill methods
- Well costs
- Planning a Well

- Well Design
- Directional Drilling – methods and calculations
- Geosteering
- Mud Logging
- The Logging unit – components and functions
- Services – monitoring, sampling, analysis

- Cuttings analysis and description
- The mud log
- Safety considerations – monitoring, overpressure, downtime

Day 3

- Mud Logging (continued)
- Gas detection and analysis – types of gas – gas shows – equipment and methods
- Pore Pressure and Wellbore Stability
- Overburden and compaction
- Pore pressure generation – estimation – normal and abnormal pressure
- Detection from Seismic – pre-drill prediction
- Stress and Strain – wellbore failure – lost circulation

Day 4

- Wellsite Geologist Responsibilities
- Sampling – types and preservation
- Quality control of acquired wellsite data
- Coring and Core Analysis
- Coring methods and equipment
- Whole Core and Sidewall Core
- Core handling and preservation
- Basic calculations – core-log integration

Day 5

- Wireline Logging Tools and Measurements
- Review of basic logging tools for lithology, porosity, saturation
- Resistivity and Invasion
- Wireline Log Interpretation
- Basic concepts – quicklook workflow
- Determination of lithology
- Shale – calculation of shale volume - effects and corrections

- Determination of porosity
- Determination of water saturation – resistivity effects – formation water
- Analysis techniques - crossplots