



Mud Logging and Wellsite Geology Course: Cuttings, Gas Shows and Formation Tops



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Introduction:

Mud logging and wellsite geology, covering cuttings, gas shows and formation tops, is a 1-week course for wellsite geology, mud logging and operations geology units that ends with a Wellsite Geology Operations Plan for a case well. Wells lose rig time and reservoir value when samples are mislagged, gas peaks are misread and coring or casing points are called late. Nominees already catch samples, watch gas curves or follow drilling, and learning is by case study on real-style mud logs, chromatograms and drilling data. CoreConcept Training Center delivers this mud logging and wellsite geology course.

Course Objectives:

- Calculate lag time and sample intervals from pump output and annular volume and verify them with carbide or tracer checks
- Describe washed cuttings to a consistent lithology, texture and porosity standard and plot percentage and interpreted lithology columns
- Interpret total gas, chromatograph C1 to C5 readings and wetness, balance and character ratios to rank hydrocarbon shows
- Correlate rate of penetration, drilling parameters and gas character with cuttings to call formation tops and drilling breaks
- Pick coring and casing points from offset tops, drill breaks and surface pressure indicators and communicate them to the rig team
- Produce daily geological reports and a Wellsite Geology Operations Plan that link surface data to geosteering and pore pressure decisions

Target Audience:

- Wellsite geology units responsible for sample description, show reporting and formation top calls on drilling rigs
 - Mud logging units responsible for gas detection equipment, sample catching and the master mud log
 - Surface data units responsible for drilling parameter sensors, lag tracking and real-time data transmission
 - Operations geology units responsible for following wells from the office and approving coring and casing decisions
 - Geosteering support units responsible for keeping horizontal wells in the target zone with surface and downhole data
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Course Outline:

Day 1: Mud Logging Unit, Sample Catching and Lag Control

- Mud Logging Unit Layout and Surface Sensor Network
- Shale Shaker Sample Catching Interval and Bag Labelling
- Lag Time Calculation from Pump Output and Annular Volume
- Carbide and Tracer Lag Checks Against Calculated Strokes
- Washed, Dried and Archive Sample Set Preparation Routine

Day 2: Cuttings Description, Lithology Logging and Show Evaluation

- Binocular Microscope Cuttings Examination at Ten Times Magnification
- Clastic Description Scheme for Grain Size, Sorting and Cement
- Carbonate Description Scheme for Texture, Grains and Visible Porosity
- Percentage and Interpreted Lithology Columns on the Master Log
- Ultraviolet Fluorescence, Solvent Cut and Residue Ring Show Tests

Day 3: Gas Detection, Chromatography and Drilling Parameter Correlation

- Gas Trap Extraction Efficiency and Total Gas Detector Response
- Flame Ionisation Chromatograph Separation of Methane to Pentane
- Wetness, Balance and Character Ratios for Fluid Typing
- Background, Connection and Trip Gas Recognition on Gas Curves
- Rate of Penetration and Weight on Bit Drilling Break Analysis

Day 4: Formation Tops, Critical Point Calls and Surface Pressure Warnings

- Offset Well Prognosis Tops and Marker Bed Recognition Criteria
- Coring Point Call Sequence from Drill Break to Circulation
- Casing Point Selection from Lithology, Gas and Top Confirmation
- Corrected d-Exponent, Cavings Shape and Flowline Temperature Warnings
- Geosteering Support with Cuttings, Gas and Gamma Ray Feedback

Day 5: Case Study Practice on a Wellsite Geology Operations Plan

- Case Well Mud Log Review and Lag Error Diagnosis
 - Case Gas Ratio Interpretation and Show Ranking Exercise
 - Case Formation Top Calls and Critical Point Decision Log
 - Daily Geological Report and Morning Call Summary Drafting
 - Wellsite Geology Operations Plan Completion and Peer Review
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Skills You Will Gain:

- Lag Time Verification
- Cuttings Lithology Description
- Hydrocarbon Show Evaluation
- Chromatograph Gas Ratio Analysis
- Drilling Break Recognition
- Critical Point Picking
- Surface Overpressure Detection
- Daily Geological Reporting

Why Attend This Course:

- Deliver a Wellsite Geology Operations Plan to the operations geologist and drilling superintendent for the next well
- Decide when to stop drilling for a core, a flow check or a casing point from lagged cuttings and gas evidence
- Avoid missed reservoir tops, cored shale and late casing points that cost rig days and data
- Pass on lag worksheets, description schemes and gas ratio templates to mud logging and geology colleagues

Conclusion:

Back at work, the participant gives the operations geologist and drilling superintendent a Wellsite Geology Operations Plan that sets sample intervals, lag checks, description standards, gas interpretation methods, critical point call rules and reporting routines for a well. Rig and office teams use it to agree coring, flow check and casing decisions before the bit reaches each target. After the first well drilled under the plan, the unit should compare called tops, show rankings and lag errors with wireline results and revise the plan.

Frequently Asked Questions FAQ:

What should participants know before a mud logging and wellsite geology course?

Participants should already work on or support a drilling rig, recognise common sedimentary rocks and read a basic well log. Bringing an anonymised mud log or daily geological report from a recent well helps them apply the case study work to familiar data.

How does mud logging and wellsite geology differ from a petroleum geology or wireline logging course?

Mud logging and wellsite geology works with surface data gathered while drilling: lagged cuttings, gas and drilling parameters. A petroleum geology course studies basins and correlation, and a wireline course covers downhole tool runs after drilling. This course turns live surface evidence into rig decisions.

Why do mud logging and wellsite geology gas ratios matter for show evaluation?

Gas ratios show what kind of fluid a zone may hold. Comparing methane with heavier components through wetness, balance and character ratios helps separate dry gas, gas with condensate, oil and residual shows, so the team can rank zones for testing and logging.

What does a participant take back from the mud logging and wellsite geology course?

Participants take back a Wellsite Geology Operations Plan for a case well, with lag worksheets, a cuttings description scheme, gas ratio templates, a critical point decision log and a daily geological report format their unit can adapt.