

SUPPLEMENTARY MATERIAL

Table detailing the drilling acronyms and terminology used in this study (adapted from Mark *et al.* 2018):

A

B

Ballooning- where lost drilling fluid returns to the formation, often at depths significantly deeper than where losses occurred

Bottom Hole Assembly (BHA)- lowest part of the drill string. This contains the drill bit, drill collar and measurement-while-drilling tools (not always run).

Bit balling- when the formation interacts with the drilling fluid, and then proceeds to swell and stick to the drill bit

Borehole breakouts- stress-induced enlargement of the borehole during drilling

C

Casing- casing is run in the hole every time the well drills to a new certain depth and the wellbore diameter is changed. Casing prevents the formation caving into the wellbore and also controls formation fluids and pressures.

Casing shoe- steel assembly at the base of a casing string.

Cement- material used to permanently seal the casing to the borehole wall

Connection- the process of adding more pipe to the drillstring. The well is no longer circulating at this point.

Curing/cured- the act of pumping down material downhole to clog high permeability zones, such as open fractures, where drilling fluid is being actively lost to.

D

Drill bit- the tool used to cut the rock.

Drilling fluid/mud loss- drilling fluid is lost into the formation either through natural permeability (such as interconnected pores or an open fracture), or drilling induced permeability (fractures created due to the mud weight set too high).

Drilling induced fracture (DIF)- Tensile fracture caused by the drilling process, often as a consequence of the mud weight set too high.

Drilling window- the pressure profile, controlled by the drilling fluid weight, at which it is safe to drill through a formation

Drilling break- a sudden increase in the rate of penetration (ROP), sometimes linked to zones of overpressure.

E

Equivalent Circulating Density (ECD)- the weight and therefore hydrostatic pressure exerted by the drilling fluid in the wellbore.

F

Fixed cutter- Drill bit with a fixed head, and no moveable parts.

Fracture Gradient- the pressure at which a formation will hydraulically fracture due to the mud weight set too high.

Fracture Integrity Test (FIT)- where the well is shut, usually after a new casing point, and the mud weight is gradually increased to test the strength of the formation.

G

H

Hybrid drill bit- drill bit with a fixed head and roller cone bits

Hole collapse- where the wellbore collapses in on itself.

I

J

K

KCL- Potassium chloride polymer, additives within water-based mud, to retard swelling of clay rich formations.

Kick- an unwanted influx of formation fluid into the wellbore

L

Leak-off test (LOT)- similar to a *FIT* but this tests the formation to the point that it fractures. This allows the determination of the maximum mud weight which could be sustained before fracturing the formation.

Liner- a casing string that does not extend all the way to the top of the wellbore.

M

N

Non-productive time (NPT)- time which is not spent drilling the hole.

O

Oil Based Mud (OBM)- type of drilling fluid with oil as the base.

Operator- the company in charge of the exploration licence and prospect being drilled.

Overburden- All the rock that needs to be drilled through to get to the economic zone of interest (i.e. the reservoir).

Overpressure- pore fluid pressures in excess of hydrostatic pressure at a specific depth

P

Pack offs- to plug the wellbore around a drillstring, usually when cuttings are not being transported effectively.

PDC drill bit- A polycrystalline diamond carbide drill bit. A type of fixed cutter drill bit.

Pulling out of hole (POOH)- The process of removing the drill string and BHA out of the hole entirely.

Q

R

Rate of Penetration (ROP)- how quickly a formation is being drilled (in ft/hr or m/hr).

Repeat Formation Tester (RFT)- sampling of the pressures within a formation.

Roller cone- a type of drill bit with rotating steel cones.

S

Side-track- the drilling of a secondary well away from the original wellbore.

Standpipe Pressure- pressure loss in the mud system.

Swelling- clays that increase in mass due to interaction with fluid.

T

Total Depth (TD)- the total depth that the well drills.

Tricone drill bit- type of rollercone bit with three steel cones.

V

W

Water based mud (WBM)- drilling mud with water as the base

Weight on bit (WOB)- the amount of downward force exerted on the drill bit.

X

Y

Z