

IODP EXP 358 Daily Geomechanics Report

Report #019 20181128 Final 4990

RTG Team

RTG Supervisor(s)	David Castillo / Thomas Finkbeiner / Demian Saffer
RTG Watch Lead (00:00-12:00)	Kan Aoike
RTG Watch Lead (12:00-24:00)	Adam Wspanialy
RTG Office Support	N/A

Well Status (as of 06:00 Nov.29 2018)

Site Name:	C0002	Hole Name:	Q
Water Depth:	1,939.0 m	RT-MSL:	28.5 m
Current Depth:	4,990.0 mBRT (4,988.0) mTVD	Section TD:	4,990 mBRT (4,988.0) mTVD
Section #:	1	CSG Depth / Size:	(4855.0) mBRT 11-3/4 "
Static MW:	1.37 sg	Current ECD:	1.43 sg
FIT/LOT/XLOT:	FIT maximum pressure = 1.45 sg, Possible "LOP" = 1.43 sg @4855 mBRT		
Current formation/ lithology:	Shale		
Sensor Offsets from the Bit:	PDC Bit: 0 m arcVision 675: (APWD: 3.59 m, Resistivity: 4.30 m, GR: 4.35 m) TeleScope 675: (IWOB: 8.47 m, Direction + Inclination: 11.84 m)		
Current Operations:	Continued reaming down. Blocky cement fragments came out from around 06:00. Encountered a tight hole at 4903 mBRT at 06:40. Reamed up/down within the tight hole at 4903~4910 mBRT until 15:30. Reamed down to 4917.5 mBRT then encountered a tight hole at 4907~4917.5 mBRT until 23:50. Reamed down with a slightly improved ROP. 4935 mBRT as of 06:00 Nov.29.		

Geomechanics Alert

GREEN	<p>Green = Projected model remains accurate</p> <p>White = Unanticipated deviation from model which <i>should not</i> affect drilling</p> <p>Yellow = Unanticipated deviation from model which <i>may</i> affect drilling</p> <p>Red = Imminent requirement to stop drilling</p>
Basis for Alert Level + Recommendations	No issue with 1.37 sg MW for Section 1

Principal Findings

N/A

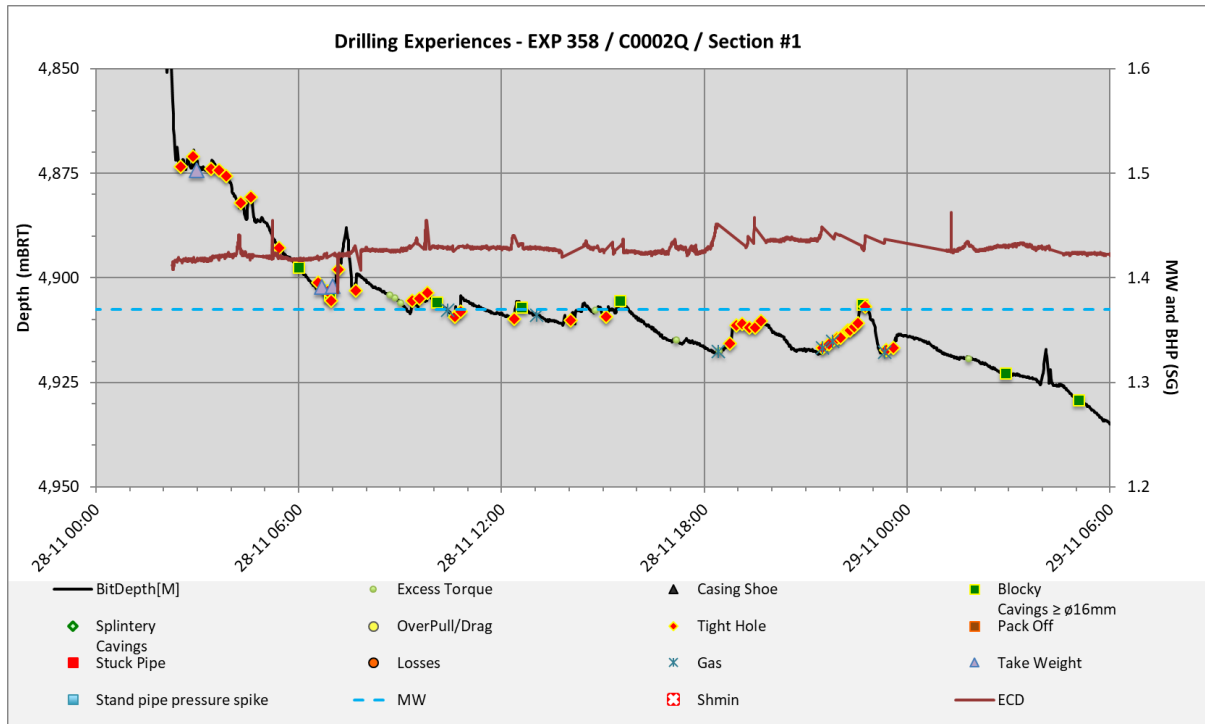
Observations Summary

Use this space to discuss any observations while drilling, running casing etc.

Fracture Gradient	N/A
Pore Pressure	Total gas elevation ~1.3 % at around 10:30 and 21:30, ~1.9 % at around 22:45.
Wellbore Breakout	N/A
Tensile Failure	N/A
Drilling Parameters	Steady ECD 1.43 sg. DTOR ~3~6 kNm while higher Surf.TOR ~30 kNm. DWOB unreliable due to wrong setting
Other	

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Analysis

LWD Data Analysis

N/A

Drilling Experience Analysis

N/A

Cuttings Analysis

N/A

Cavings Analysis

No regular sampling was performed for samples during the reaming operations. Instead, RTG WL took spot samples sometimes for check.

After the BHA got into the rat hole, a bunch of blocky cement fragments came out along with a few amount of rounded blocky shale cavings ~ \varnothing 2.5 cm in diameters. Cavings population increased from ~5% to ~95 % with time by 15:00. On the other hand, amount per unit volume of total solids decreased from ~50% to ~20% by 15:00 Nov.28. However, it increased to ~50 % again between 16:00~19:00 Nov.28 and decreased to ~20 % by 05:00 Nov.29. Blocky/angular cavings with rounded edges, that is, reworked cavings comprise the majority of cavings ~90% as those collected in the same intervals during the kick-off drilling. Caving sizes are up to \varnothing 2 cm, averagely ~ \varnothing 1 cm in diameters in general. Fresh cavings or rather cuttings, ~ \varnothing 1 cm in diameters, comprising ~10% of cavings, are platy, angular or splintery in shape. They are conceivably formed by mechanical impact of the bit or other parts of the BHA. Some those fresh cavings/cuttings have scratch marks.

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SFIB Analysis

N/A

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Geomechanical Model Review (a review of the FIT results)

Potentially no changes to the pre-drill geomechanical model because FIT (Formation Integrity Test) does not directly contribute sufficient information for constraining or refining subsurface earth stresses. By design, FIT is intended to determine whether the planned mud weight can be supported by the formation.

The planned mud weight of 1.37 sg with an operational safety upper margin of +0.06 sg (surge pressure), required a formation pressure integrity up to 1.43 sg. The FIT in the C0002Q rat-hole achieved that objective. It is possible that a leak-off pressure of 1.43 sg may have occurred, but a maximum pressure of 1.45 sg was achieved before the pumps were shut-in. If a leak-off pressure of 1.43 sg did occur, this implies a leak-off-test (LOT) had occurred (no longer a FIT). A leak-off-pressure of 1.43 sg may be interpreted as a possible approximation of S3 or Shmin stress magnitudes.

This interpretation would require a pass of the LWD image log across the rat-hole section to identify whether a new tensile was created, or drilling fluids leaked into a pre-existing bedding plane or natural fracture. The former would have direct implications of S3, while the latter would require further information such as bedding plane orientation.

However, since no LWD data acquisition is planned for the rat hole section, we will have no chance to confirm which case occurred. Therefore, we continue to call this test a FIT.

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