

IODP EXP 358 Daily Geomechanics Report

Report #015 20181124 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.24 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:	1.41 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 MicroScope HD 675: (UHRI: 2.10 m, Resistivity: 3.02 m, GR: 4.50 m) arcVision 675: (APWD: 7.59 m) TeleScope 675: (IWOB: 12.43 m, MWD GR: 15.15 m, D+I: 15.79 m) SonicScope 675: (Sonic: 25.90 m) seismicVISION 675: (Geophone Radial-1: 31.80 m, Geophone Radial-2: 31.84 m, Geophone Axial: 31.94 m, Hydrophone: 32.18 m)		
Current Operations:	Continued circulation & bottoms-up. Attempted to reamed down from 4895 mBRT to 4904 mBRT from 08:00 but no success. Decided POOH. Took a survey at 4899.4 mBRT and then reamed up with LWD data acquisition from 4898 mBRT to 4855 mBRT from 09:00 to 11:00. Continued POOH 8-1/2" x 12-1/4" LWD BHA. 58.3 mBRT as of 06:00 Nov.25.		

Geomechanics Alert

GREEN	Green = Projected model remains accurate White = Unanticipated deviation from model which <i>should not</i> affect drilling Yellow = Unanticipated deviation from model which <i>may</i> affect drilling Red = Imminent requirement to stop drilling
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	N/A
Wellbore Breakout	N/A
Tensile Failure	N/A
Drilling Parameters	N/A
Other	

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Analysis

Real-Time LWD MicroScope and Resistivity Log Review

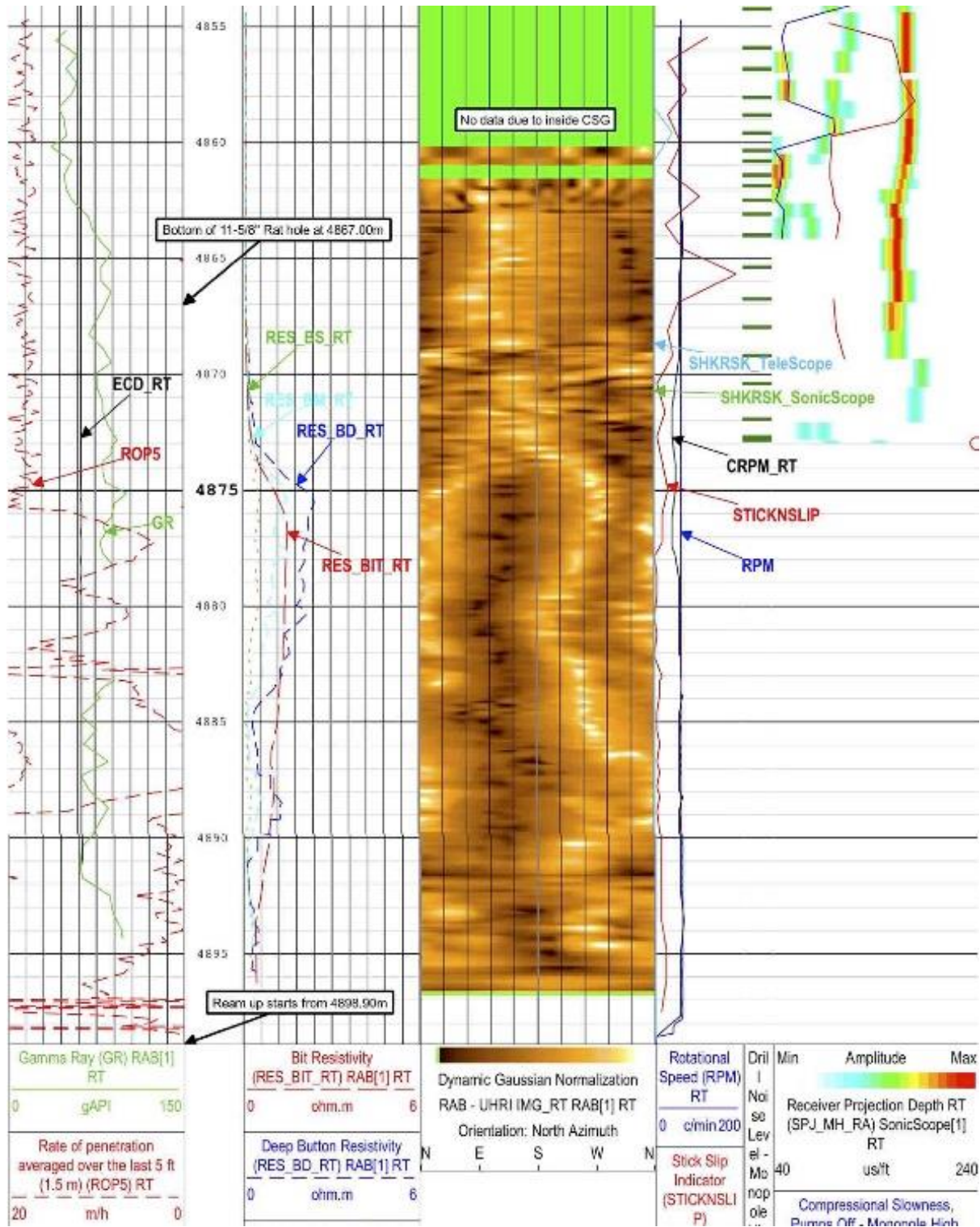
Real-time LWD data (MicroScope, resistivity and sonic) taken in the interval below the 11-3/4" CSG window while POOH are plotted below. Resistivity logs show low values (<2 ohm·m) compared with those of the C2P hole at the same interval (2~3 ohm·m), which may suggest enlarged borehole diameter throughout the interval. Low resistivity values <1 ohm·m in the interval of 4885-4896 mBRT are indicative of materials with no electrical resistivity implying the tool may be measuring drilling fluid resistivity. Some separation among shallow, intermediate and deep resistivities in the interval of 4874-4884 mBRT may suggest some mud invasion to the formation or relatively narrow annulus between the tool and the borehole wall. The interval above 4873 mBRT is regarded to be affected by the lower side of the casing window.

Since the borehole in this section is inclined 4.4 degrees eastward, the west and east azimuths approximate the lower and the upper sides, respectively. The azimuthal variation of the bright line (high resistivity) near WSW probably indicates the tool's lower side was in contact with the borehole wall. Similarly, the azimuthal variation of the dark line (low resistivity) along the opposite azimuth (upper side of the tool) reflects large separation of the tool from the borehole wall. The image of the section above 4873 mBRT can be interpreted that the upper side of the tool subsequently came to contact with the borehole as the tool approached the window.

Forward plan is to review the MicroScope and resistivity using memory data and compare with the data resolution obtained using real-time LWD data. This exercise will help interpret the real-time data more confidently during operations.

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Drilling Experience Analysis

N/A

Cuttings Analysis

N/A

Cavings Analysis

N/A

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SFIB Analysis

N/A

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 S_3 or S_{hmin} 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 S_3 , 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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