

IODP EXP 358 Daily Geomechanics Report

Report #033 20181212 Final 5230

RTG Team

RTG Supervisor(s)	David Castillo / Thomas Finkbeiner / Demian Saffer
RTG Watch Lead (00:00-12:00)	Emily Wisbey
RTG Watch Lead (12:00-24:00)	Toby Colson

Well Status

Site Name:	C0002	Hole Name:	Q
Water Depth:	1,939.0 m	RT-MSL:	28.5 m
Current Depth:	4928 (4926) 5230.0(5227.0) mBRT(mTVD)	Section TD:	5,667.5 (5,664.5) mBRT mTVD
Section #:	1	CSG Depth/Size:	(4855.0) 11-3/4 mBRT
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:	arcVISION 675: (APWD: 3.71 m, Resistivity: 4.42 m, GR: 4.47 m) TeleScope 675: (Direction + Inclination: 11.94 m)		
Other BHA Offsets from the Bit	8-1/4" Stabilizer: 17.50~19.09 m 8-1/4" x 12-1/4" Z-reamer: 28.51~29.86 m 8-1/8" Stabilizer: 40.04~41.70 m 3 x 8-1/2" Drill Collar: 137.07~164.42 m 10-5/8" Stabilizer: 164.42~165.39 m 6 x 8-1/2" Drill Collar + Jar: 165.3~229.99 m Top of BHA: 343.46 m		
Current Operations:	Pulled back to kick off point to underream the sidetrack of preference (smaller dogleg). Dropped ball to active 12-1/4" underreamer. Washed down to 4920 mMDRT where increase in ECD was observed. Pulled off bottom and ECD returned to nominal pressure. Return to drilling where by increased ECD and SPP continued to be observed with high torque. Pulled of bottom to circulate bottoms up. Continue circulating bottoms up, volume of cuttings at shakers unchanged since washing down.		

Geomechanics Alert

GREEN	<p>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</p>
Basis for Alert Level + Recommendations	<p>Hole condition remains stable with fresh cuttings continuing to be liberated from mechanical interaction. 1.37 sg remains recommended MW for Section 1.</p>

Principal Findings

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Observations Summary

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

Fracture Gradient	N/A
Pore Pressure	No significant gas peaks or other indications of overpressure observed.
Wellbore Breakout	N/A
Tensile Failure	N/A
Drilling Parameters	<p>Higher RPM (>100crpm) noted to be associated with increased ECD.</p> <p style="text-align: center;">EXP 358 ECD V RPM from the 11th - 13th December</p> <p style="text-align: center;">EXP 358 LWD from the 11th - 13th December</p> <p style="text-align: center;">EXP 358 Bit Depth from the 11th - 13th December</p>
	Figure 1 Torque, ECD and LWD correlation
	Other

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Analysis

Drilling Experience Analysis

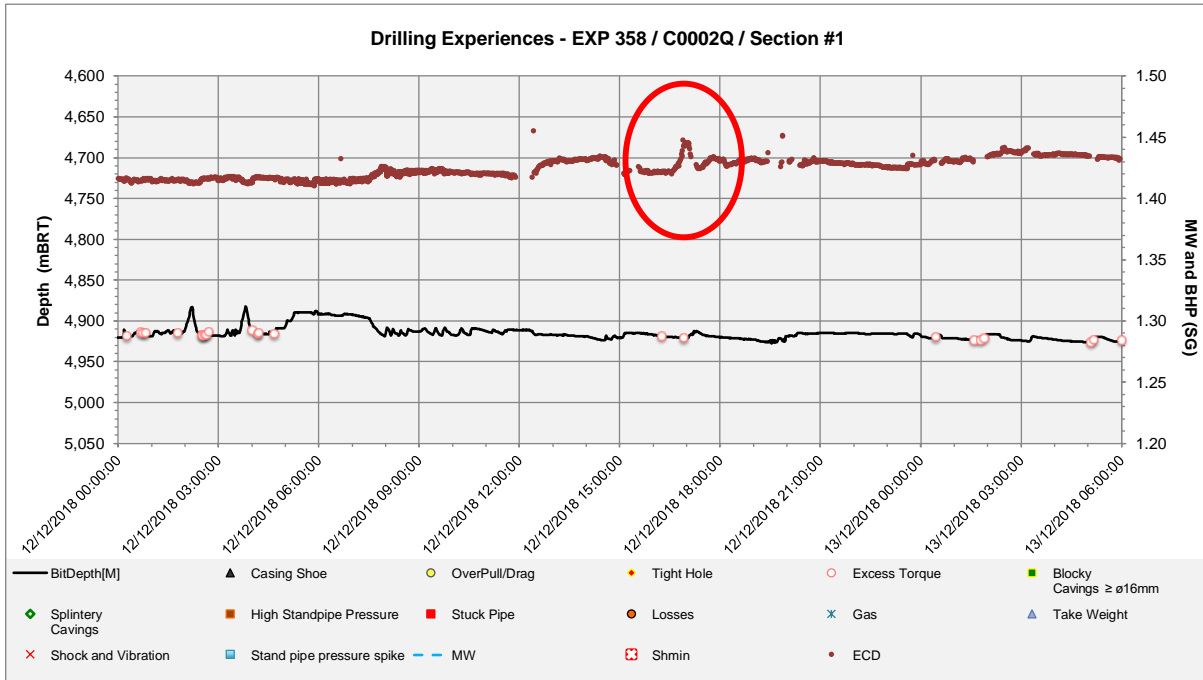


Figure 2 Drilling Experiences over the last 24hrs

The last 24hrs have been spent washing and reaming down the “QA well”. At 17:40 on the 12th Dec ECD increased rapidly (Figure 2 red circle), after which hole cleaning has been the focus.

Cuttings Analysis

Silty claystone is dominant, with traces of cement.

Cuttings volume over the shakers has remained constant from 2000hrs on the 12th December 2018 when it was decided to pick up off bottom and circulate.

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Cavings Analysis

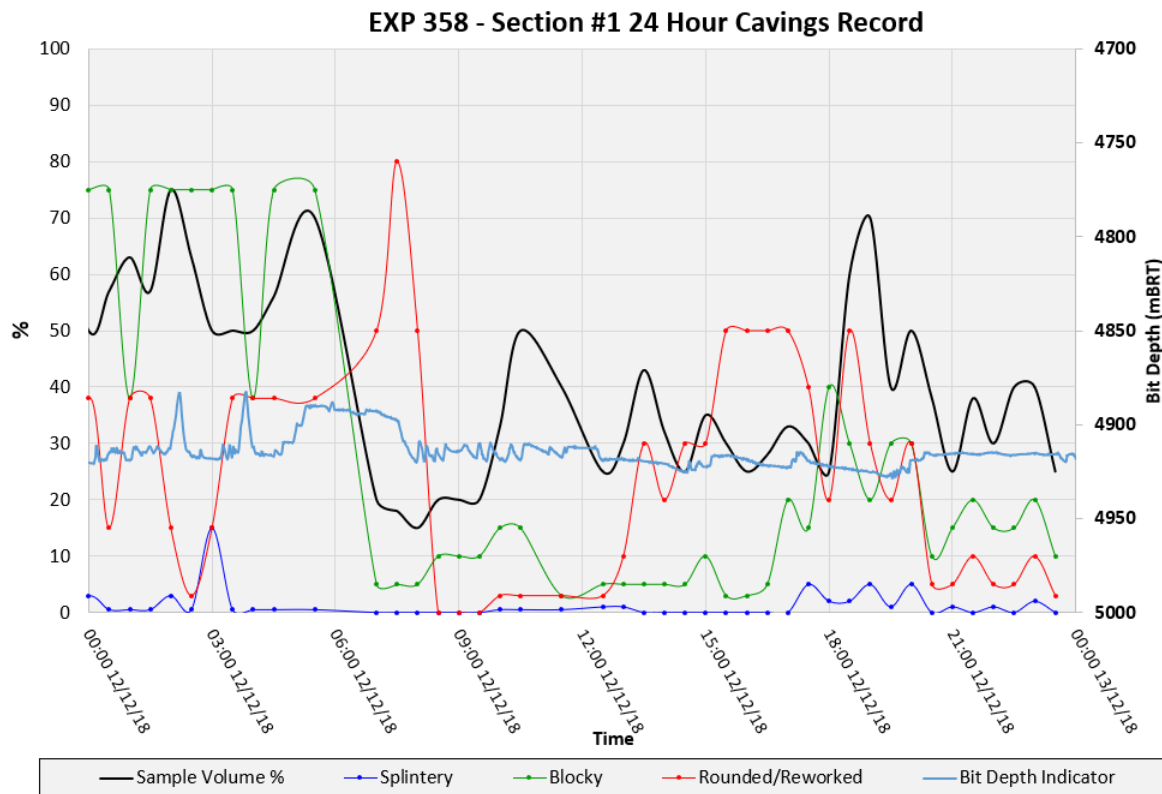


Figure 3 Analysis of cuttings/cavings > ϕ 4mm (taken from 400cc RTG Samples) over last 24hrs

The amount of cuttings/cavings > ϕ 4mm per unit volume was high at ~70%, with the majority of the samples were fresh block/angular, with reworked blocky angular consisting of ~10-30%, increasing in proportion to decreasing volume of fresh blocky cuttings.

The presence of fresh platy cavings continued, likely the result of mechanical damage to the formation from reaming / wiping over the same interval for ~48hrs (4,885 to 4,920mBRT)

The increase in the volume of cement further confirms that the BHA is in the "QA well", as the volume of cement at TD of the "QB well" was trace. The volume of cement at the shakers continues to be 0-10% with many large (>30mm), rounded cement blocks coming to the shakers. The rounded shape indicates the cement blocks were generated while milling the window.

The large blocks of cement (~3cm diameter) occur at the shakers indicating that the hole cleaning is capable of lifting large cavings, in the event that extreme hole cleaning is needed.

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LWD Data Analysis

RT resistivity increases rapidly over the interval of 4,912-4916mBRT (4,916-4,920mBRT bit depth) from 0.5ohm.m to 2.5ohm.m (Figure 4), showing a very different profile compared to the resistivity log from C0002P at these depths (Figure 5).

This could indicate;

- The BHA is passing from an overgauge hole into a gauge hole
- It's possible cuttings are accumulating in overgauge hole due to insufficient annular velocity, as APWD sensor passes into overgauge hole the ECD ↑

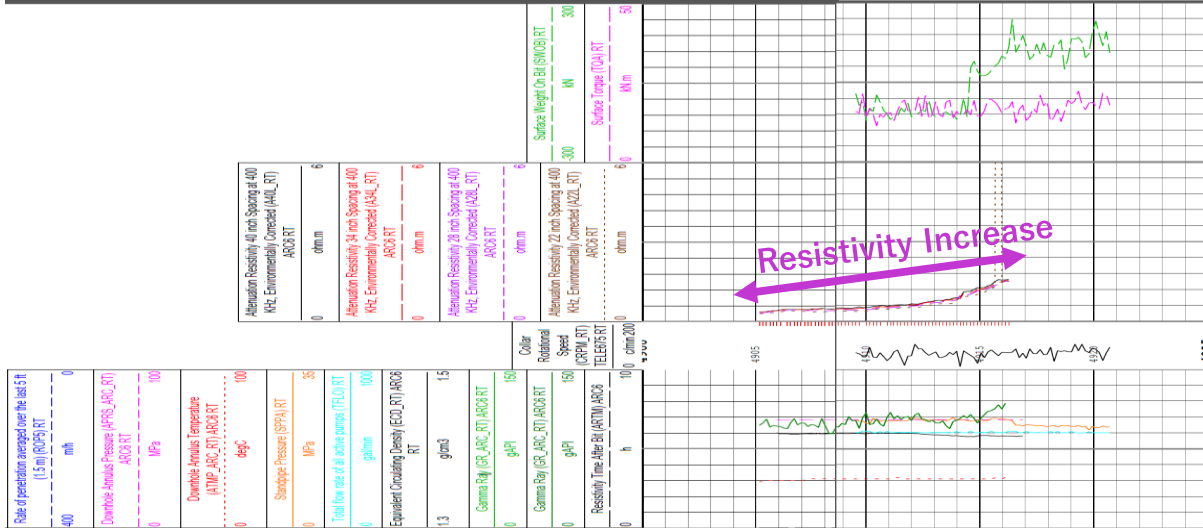


Figure 4 Section #1 Run #5 arcVISION Resistivity increase

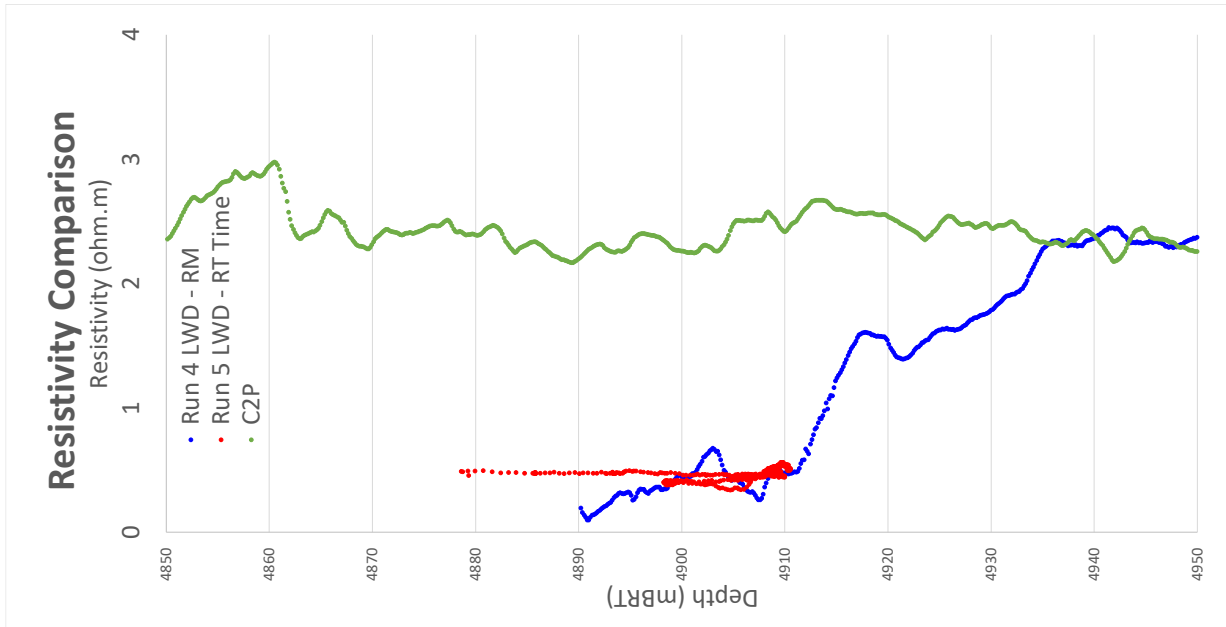


Figure 5 Resistivity Comparison between runs and wells (Note Run 5 data from the 13th December)

SFIB Analysis

N/A

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Geomechanical Model Review

No change in the latest stress model. Along with reducing sand and solid content by conditioning mud properties, ECD (APWD) decreased from 1.43 sg to 1.41 sg while drilling down below 5110 mBRT. The current mud condition could keep ECD within the planned MW window.

