

IODP EXP 358 Daily Geomechanics Report

Report #054a 20190102

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)	Toby Colson

Well Status

Site Name:	C0002	Hole Name:	R
Water Depth:	1,939.0 m	RT-MSL:	28.5 m
0600h Depth:	5,052.0 mBRT (5049.0) (mTVD)	Section TD:	5,667.5 mBRT (5,664.5) (mTVD)
Section #:	0	CSG Depth/Size:	4757.0 mBRT 11-3/4 inches
Static MW:	1.39 sg	Current ECD:	(1.41) sg
FIT/LOT/ XLOT:	1.46sg FIT @ 4,757mBRT.		
Current formation/ lithology:	Shale		
Sensor Offsets from the Bit:	TeleScope 675: (Direction + Inclination: 18.00 m)		
Other BHA Offsets from the Bit:	8-1/2" Mill Tool Bit: 0~0.24 m Motor with 1.5 deg bend: 0.24~8.09 m 8.125" Stabilizer: 8.09~9.76 m 2 x 6-3/4" Non-Magnetic Drill Collar + TeleScope 675: 10.54~32.21 m 9 x 6-3/4" Drill Collar: 32.21~116.80 m 6-1/2" Hydraulic Jar: 116.80~126.73 m 2 x 6-3/4" Drill Collar: 127.73~145.39 m 12 x 5.68" Heavy Weight Drill Pipe: 146.19~257.14 m Top of BHA: 258.14 m		
Current Operations:	Continued drilling the 8-1/2" hole with a combination of rotary and sliding drilling to 5052 mBRT. After reaching TD, performed circulation and bottoms up for 3 hours and then wiper trip. 4974.5 mBRT (bit depth) as of 06:00 Jan.3 rd .		

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	1.39 sg remains recommended MW for Section 1. Observation suggests hole cleaning remains a key factor in current wellbore condition.

Principal Findings

N/A

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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 indications of overpressure observed.
Wellbore Breakout	N/A
Tensile Failure	N/A
Drilling Parameters	N/A
Other	N/A

Analysis

Drilling Experience Analysis

Drilled ahead from 4996.5 mBRT with a combination of rotary drilling and sliding. Multiple overpull/drag events occurred while picking up BHA to record survey's. No adverse conditions occurred while drilling or sliding.

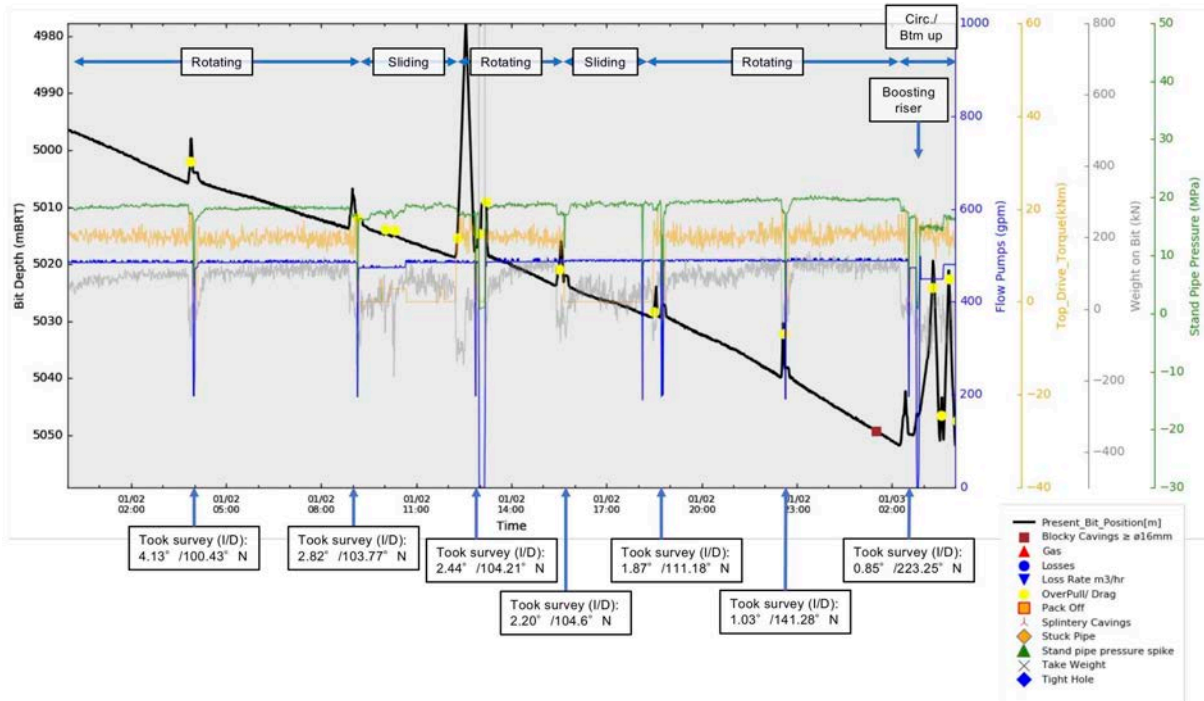


Figure 1: Drilling experiences over the last 28 hrs (~04:00 Jan. 3).

Cuttings and Cavings Analysis

Coarser shale/mudstone fragments > ϕ 4mm with sharp edges were typically blocky with minor occurrence of platy fragments dominated the cuttings populations down to 5032.5 mBRT lag depth. Samples approximately $\sim\phi$ 10 mm likely reflect cuttings created by the tri-cone bit. No obvious indications of wellbore instability were seen in the shale/mudstone fragments that could not be explained by the tri-cone bit cutters. Tuff fragments with generally rounded shapes remain present throughout; however, proportion in coarser grains $\geq \phi$ 4mm are \sim 1~2 % in most samples. Occurrence of large tuff fragments (ϕ 16~28 mm) were rare, but remains occasionally present until reaching TD. These tuff fragments may be fresh blocky cavings derived from tuff layers within the 4840-4843 mBRT interval or tuff layers elsewhere. It is possible that the weak boundaries between the tuff and claystone/siltstone are inducing small scale and local anisotropic failure.

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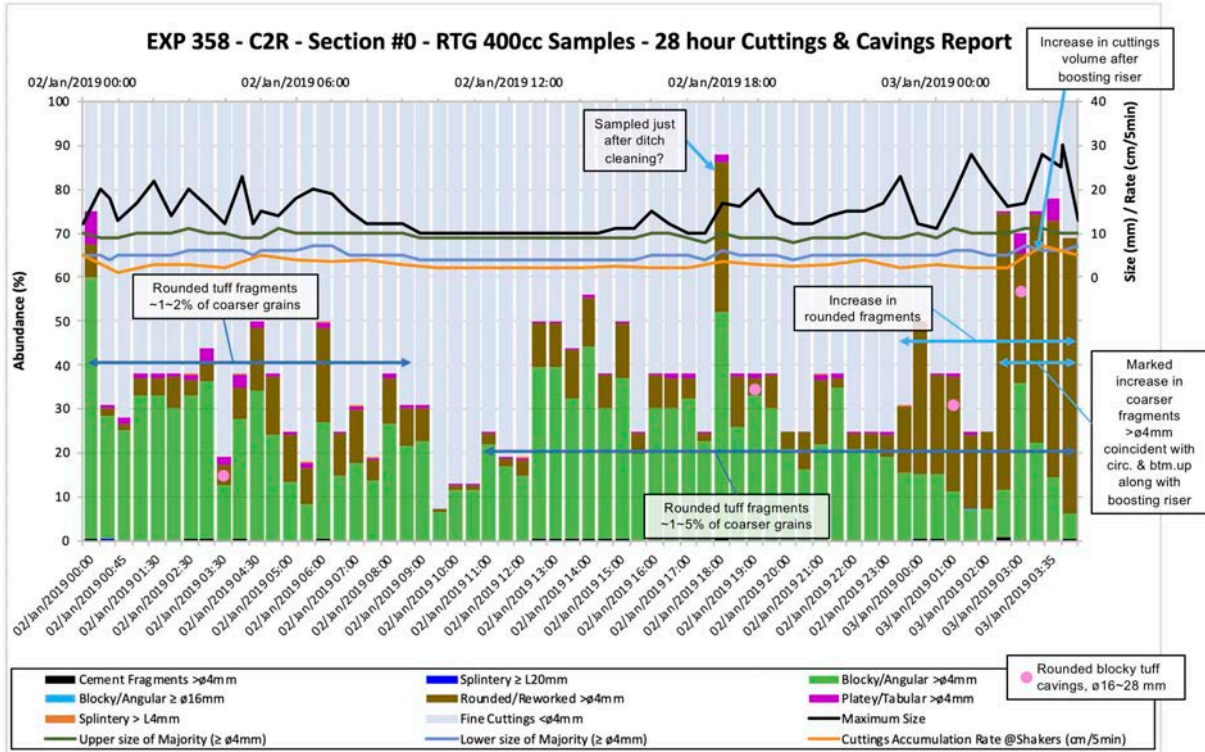


Figure 2: Analysis of cuttings/cavings > ø 4mm (taken from 400cc RTG Samples) over last 28 hrs (~04:00 Jan.3). Not corrected for lag-time. The marked increase in rounded cuttings after 0230 hrs is likely due to cuttings that were trapped in the riser and released after increasing the riser flow rate to ~900 gpm (boosting riser). The increase in rounded blocky cuttings at 2330 hrs indicate cuttings that have not been removed in the hole cleaning process.

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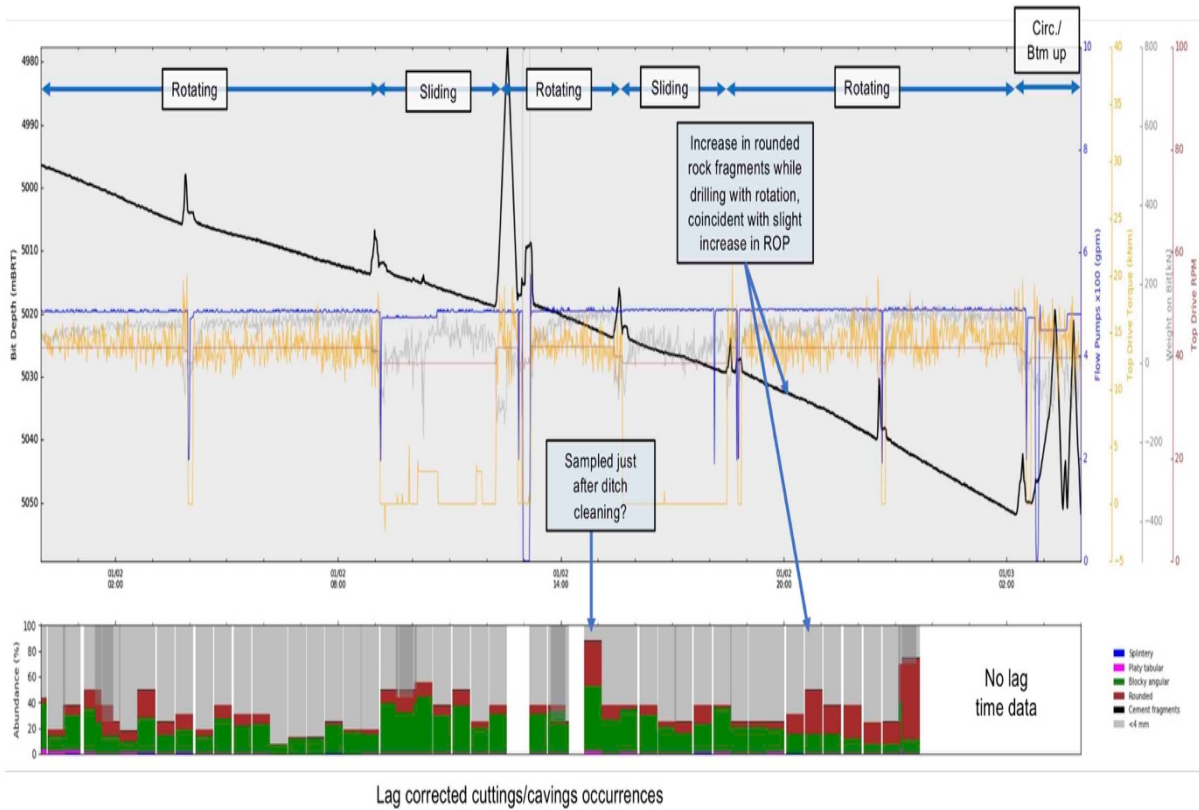


Figure 3. Correlation between drilling events and lag corrected cuttings/cavings occurrences over last 24 hrs (00:00~24:00 Jan.2). This increase in rounded cuttings at 2000 hrs and again at 2300 hrs may indicate that current hole cleaning practices at ~480 gpm were being hampered. If cuttings are being trapped around the drill-pipe or seated on breakout ledges, pipe movement while taking surveys may have stirred these up.

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Figure 4: Example of cuttings/cavings > \varnothing 4mm (taken from 400cc RTG Samples). This sample is predominantly rounded shale fragments $\leq \varnothing$ 10 mm, associated with rounded large blocky tuff cavings.

LWD Data Analysis

N/A

SFIB Analysis

No further updates

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Geomechanical Model Review

No change in the current stress model.

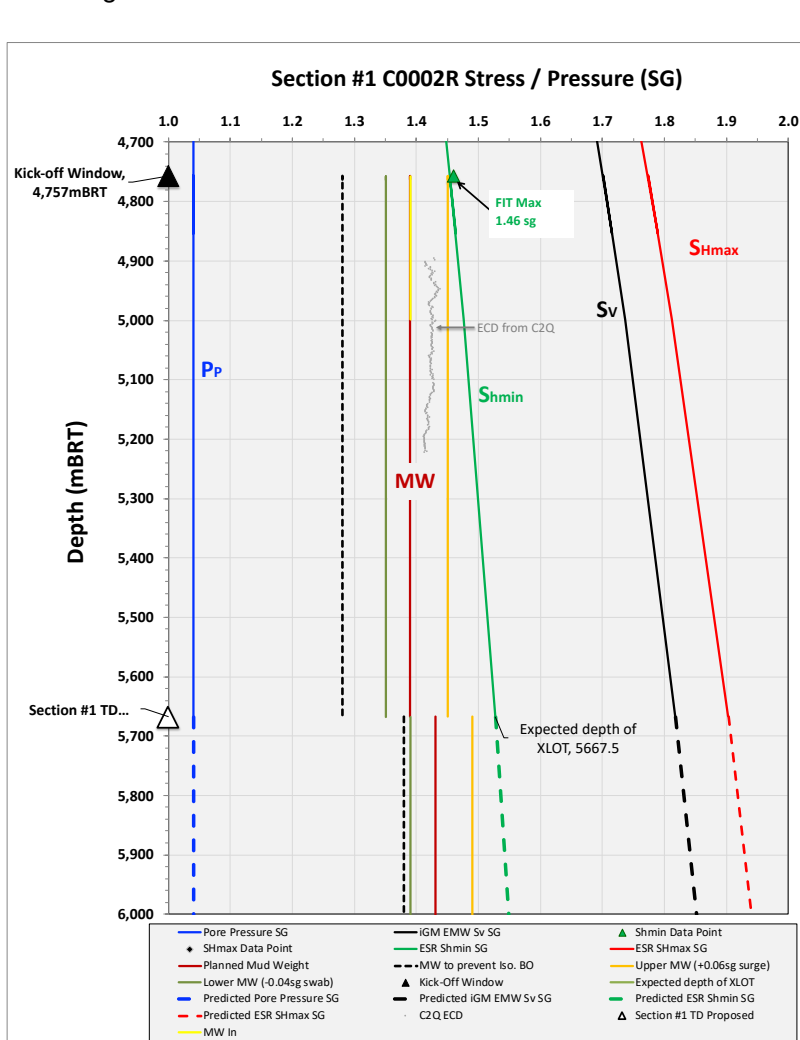


Figure 5: Current stress model for Section #1

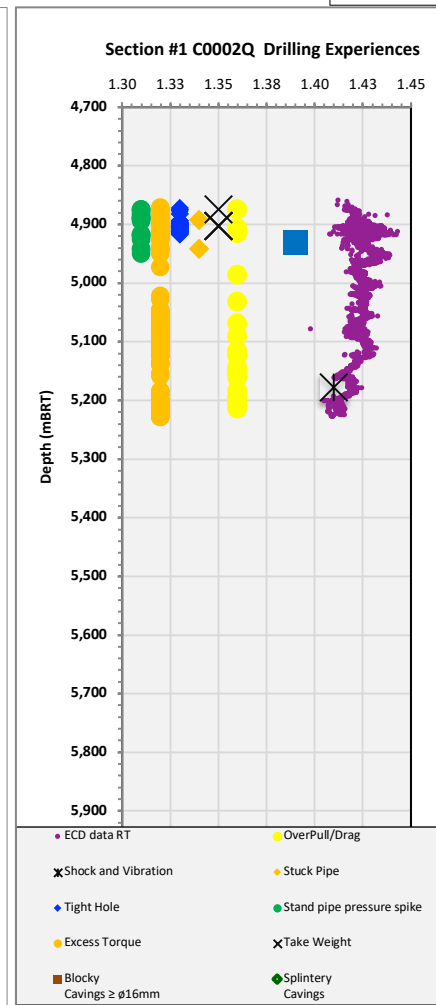


Figure 6: C0002Q Drilling Experiences

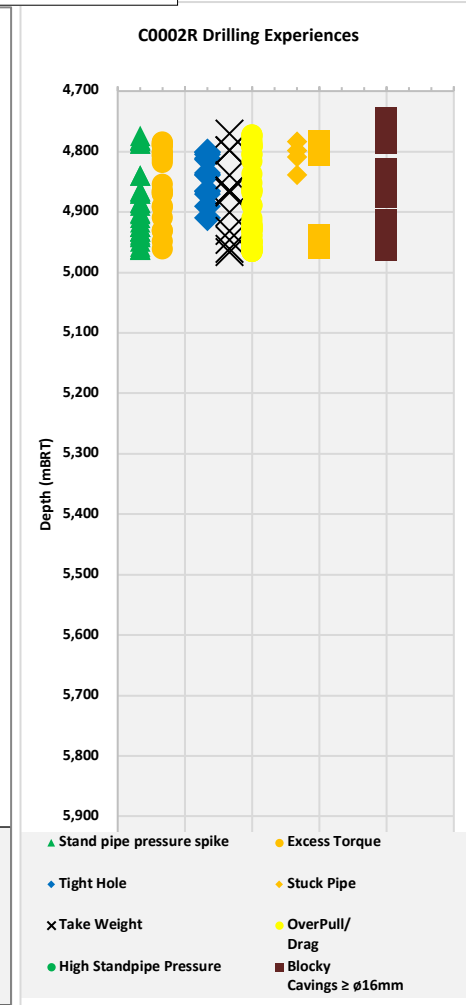


Figure 7: C0002R Drilling Experiences