IODP EXP 358 Daily Geomechanics Report

Report #053 20190101

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:	5,008.5 (5005.5)	mBRT (mTVD)	**Section TD:**	5,667.5 (5,664.5)	mBRT (mTVD)
Section #:	0		**CSG Depth/Size:**	4757.0 11-3/4	mBRT 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.				

Geomechanics Alert

GREEN	Green = Projected model remains accurate White = Unanticipated deviation from model which *should not* affect drilling Yellow = Unanticipated deviation from model which *may* 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 4965 mBRT with a combination of rotary drilling and sliding. Whilst sliding incurred a low ROP, there was little SPP or cutting morphology/size variation between the two modes of drilling. Flow rate has been maintained above 450 gpm or close to the current prescribed upper working limit. Below around 4972 mBRT, ROP was slightly improved.

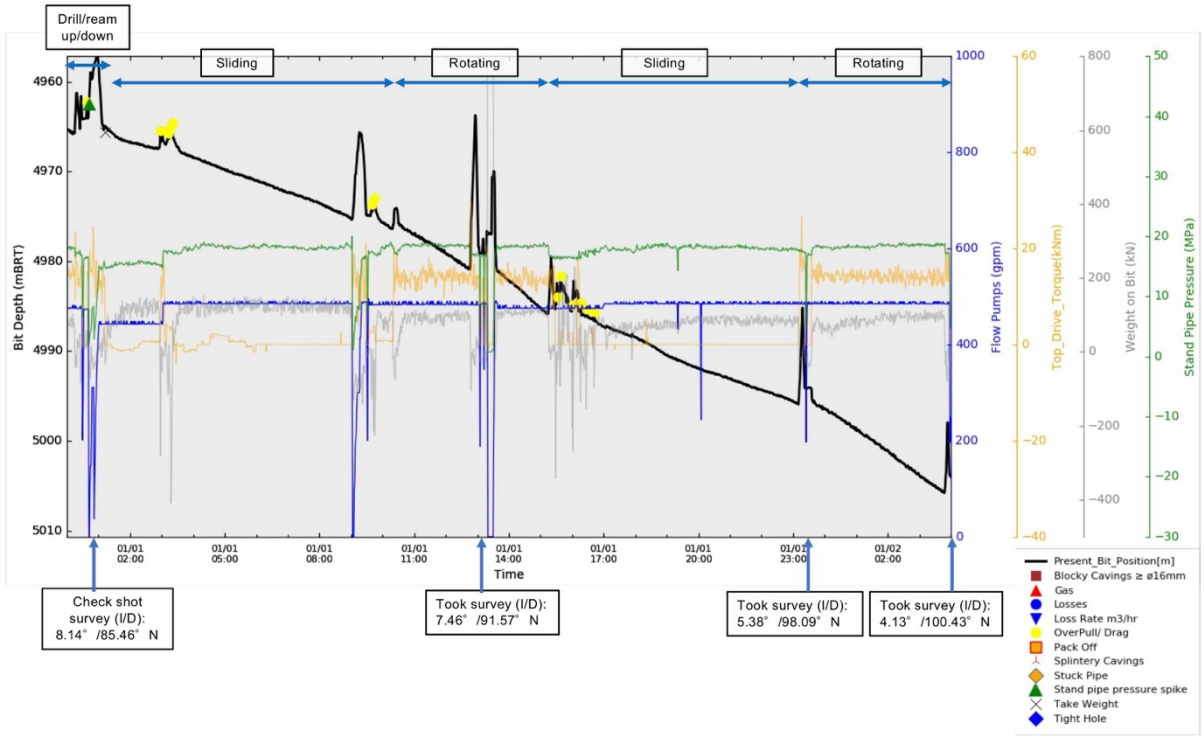

Figure 1: Drilling experiences over the last 28 hrs (~04:00 Jan. 2).

Cuttings and Cavings Analysis

Coarser shale/mudstone fragments > ø4mm with sharp edges were typically blocky with minor occurrence of platy fragments. Samples approximately ~ø10 mm likely reflect cuttings using the tri-cone bit. They increased below around 4968 mBRT lag depth and became the predominant cuttings fragments. 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 ≥ ø4mm decreased from 5~30% to 1~2 % at around 4975 mBRT lag depth. Occurrence of large tuff fragments (ø16~35 mm) were rare below 4974 mBRT lag depth. 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.

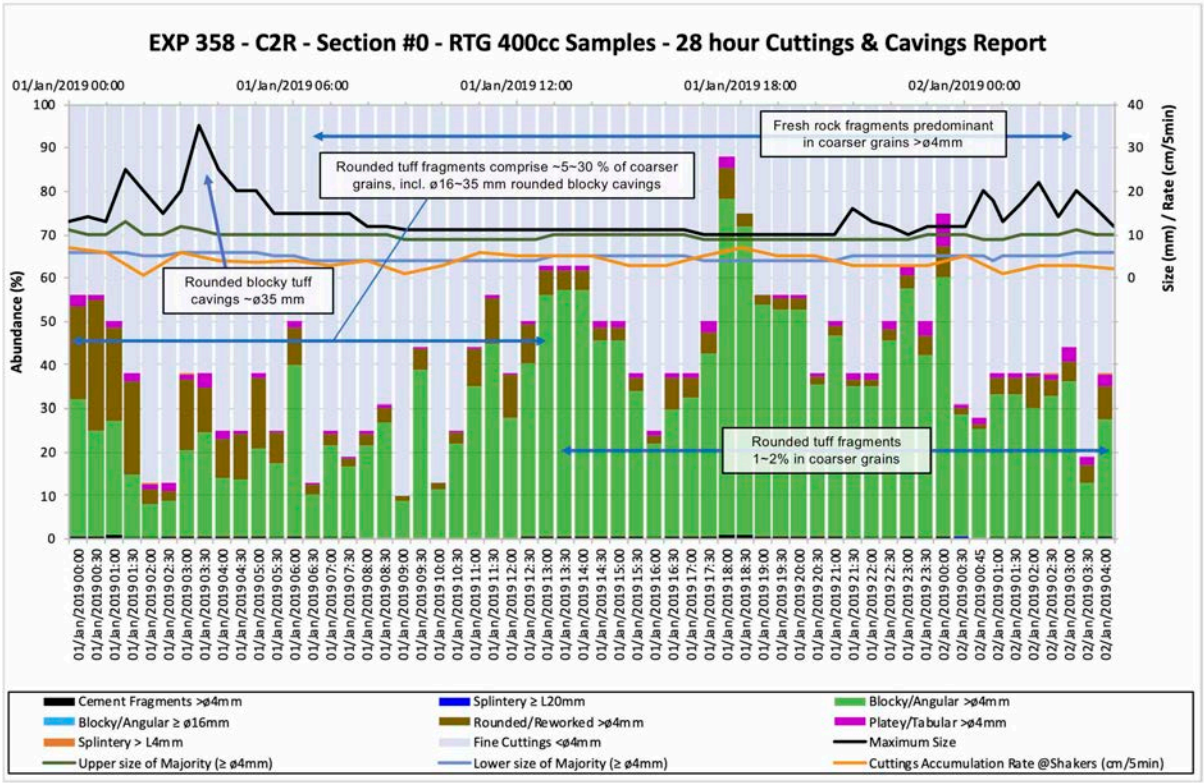

Figure 2: Analysis of cuttings/cavings > ø 4mm (taken from 400cc RTG Samples) over last 28 hrs (~04:00 Jan.2). Not corrected for lag-time.

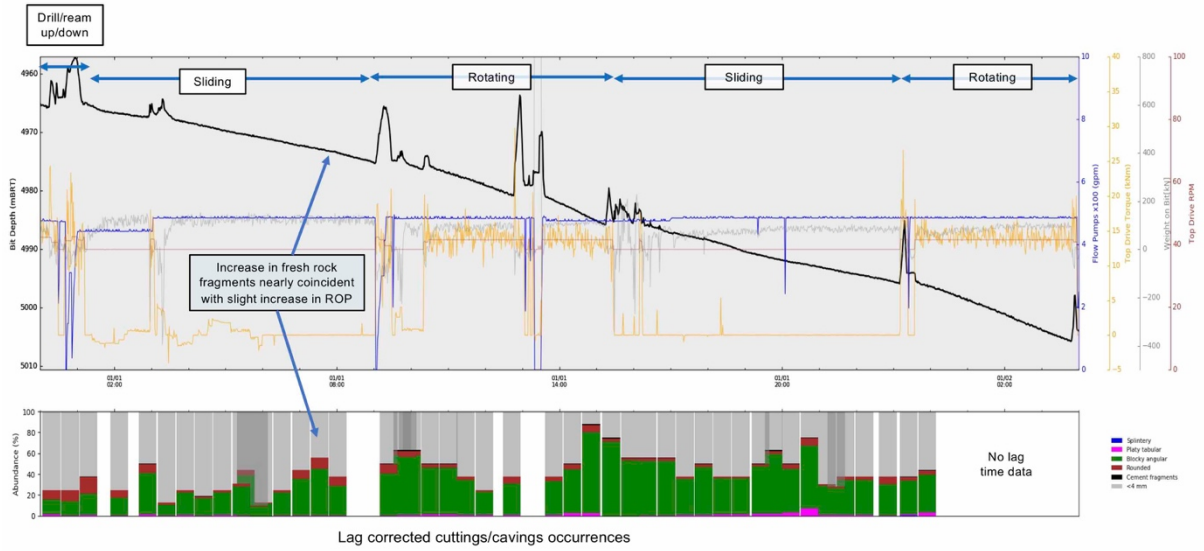

Figure 3. Correlation between drilling events and lag corrected cuttings/cavings occurrences over last 24 hrs (00:00~24:00 Jan.1).

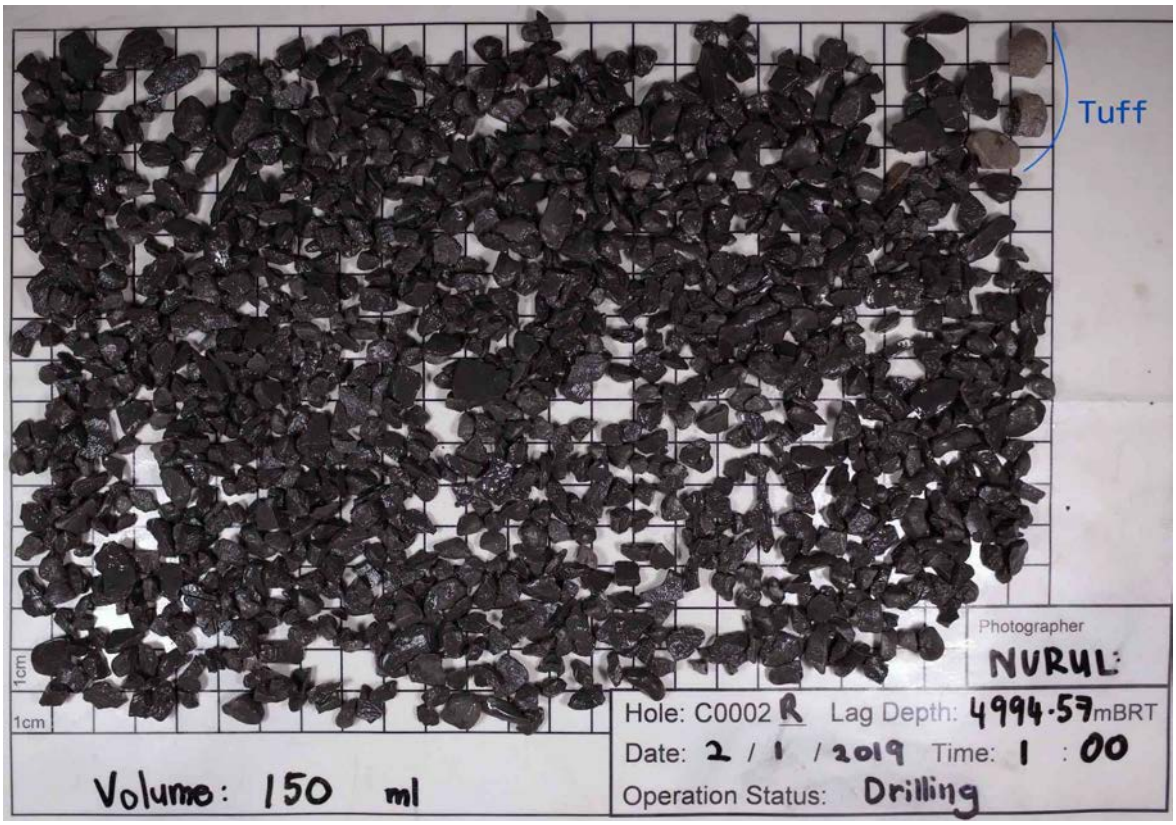

Figure 4: Example of cuttings/cavings > ø 4mm (taken from 400cc RTG Samples). Fresh shale fragments ≤ ø10 mm are predominant. Light gray rounded to sub-rounded grains are tuff fragments.

LWD Data Analysis
N/A

SFIB Analysis
No further updates

Geomechanical Model Review

No change in the current stress model.

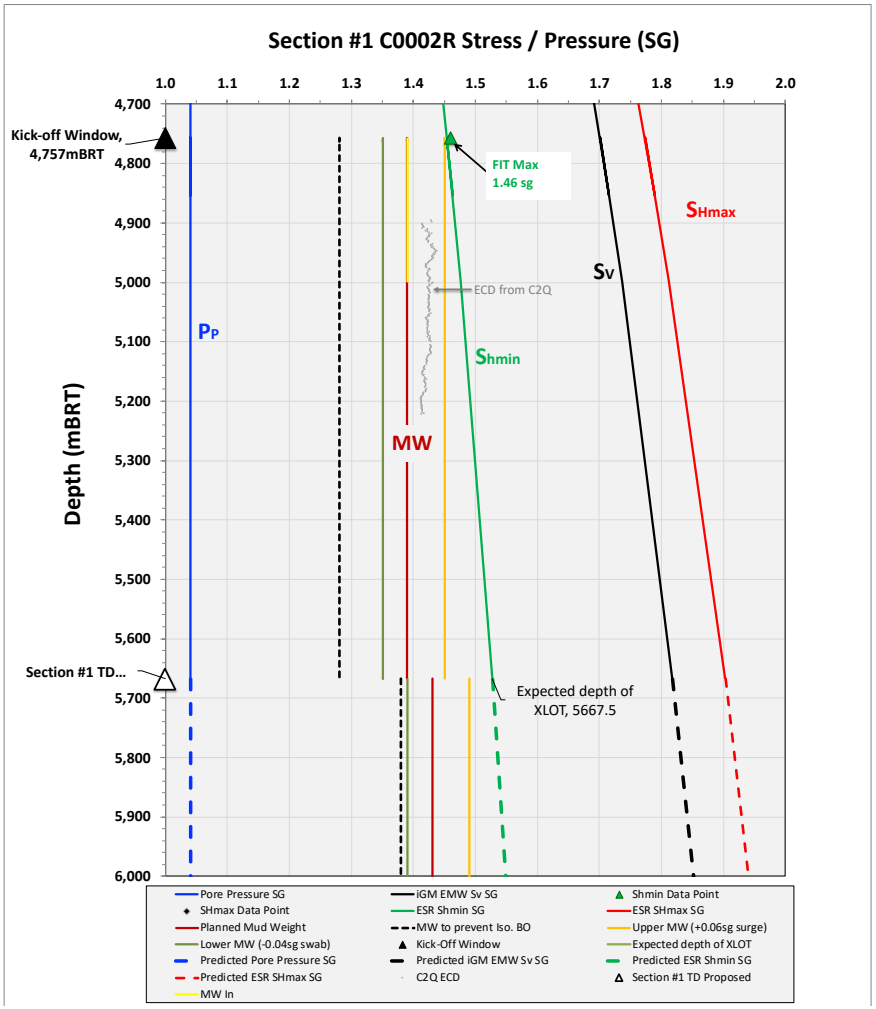

Figure 5: Current stress model for Section #1

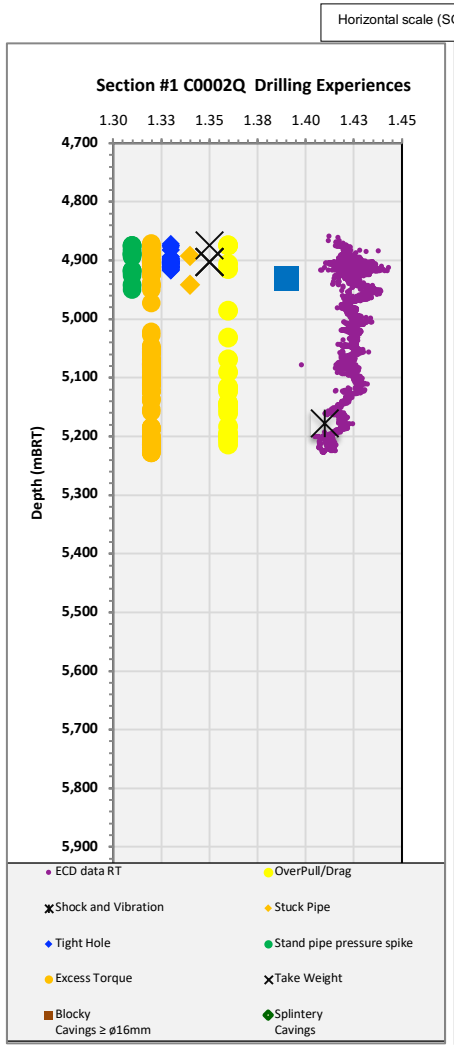

Figure 6: C0002Q Drilling Experiences

Figure 7: C0002R Drilling Experiences