

IODP EXP 358 Daily Geomechanics Report

Report #089 20190206

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)	Emily Wisbey

Well Status

Site Name:	C0002	Hole Name:	S
Water Depth:	1,939.0 m	RT-MSL:	28.5 m
0600h Hole Depth:	4,830.5 mBRT (4,828.5) (mTVD)	Section TD:	6,000.0 mBRT (5,998.0) (mTVD)
Section #:	1	CSG Depth/Size:	4,769~4,775 mBRT 11-3/4" ESET inches
Static MW:	1.38 sg	Current ECD:	1.42 sg
FIT/LOT/ XLOT:	N/A Note: 1.46sg FIT @ 4,757mBRT		
Current formation/ lithology:	Shale		
Sensor Offsets from the Bit:	Xceed 675 (D+): 4.159 m MicroScope 675 (Resistivity: 26.710 m) ARC-6 (APWD: 31.197 m, Resistivity: 31.909 m, GR: 31.960 m) TeleScope 675 (IWOB: 36.072 m, D+): 39.437 m) SonicScope 675 (Sonic: 49.627 m) seismicVISION 675 (Hydrophone: 55.890 m)		
Other BHA Offsets from the Bit:	8-1/2" PDC Bit (AxeBlade XZ716): 0~0.258 m Xceed675 8-3/8" Stabilizers: 0.258~8.027 m Lower C-Link 675: 8.027~10.971 m 675ERT7850 Motor: 12.797~21.163 m Upper C-Link 675: 21.871~24.413 m MicroScope 675: 24.413~29.572 m ARC-6: 29.572~35.243 m TeleScope 675: 35.243~43.795 m SonicScope 675: 43.795~53.745 m seismicVISION 675: 53.745~58.199 m 6.75" Collars + XOs: 59.112~198.355 m Drilling Jar: 198.355~208.090 m 6.75" Collars + XOs: 208.090~227.546 m		
Current Operations:	Continued RIH 8-1/2" LWD BHA w/ RSS + vorteX motor. Washed down from 4781 mBRT, then drilled down from 4787 mBRT. Encountered tight hole at 4804 mBRT and worked pipe without rotation for 40 min. Reamed up once to 4775 mBRT then resumed drill ahead. Bit depth 4830.5 mBRT as of 0600 Feb.7.		

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	<p>C2S can initially be drilled with a 1.35 SG MW using only FracSeal as the mud additive.</p> <p>While C2S is within 2-4 m horizontally from the C2P hole, an extra amount of FracSeal should be blended with the mud to seal the existing open cracks/beds/fractures as quickly and efficiently as possible. The extra FracSeal would help maximise stability in the fragile hole section near the C2S window and keep it stable during drilling, POOH with LWD BHA, and RIH/POOH with coring BHA operations.</p>

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	<p>If we find earth stress gradients increases with depth (and UCS does not increase as quickly), RTG may recommend increasing the MW slightly (e.g., +0.01 SG increments) with Watch Leaders and Supervisors closely monitoring. This process could be repeated based on real-time learnings. Any subsequent increase in MW in C2S would not pose a serious risk of drilling fluid invasion in the shallower sections if FracSeal was applied generously.</p> <p>1.35 SG MW would increase ROP and perhaps deepen section TD if needed.</p>
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Principal Findings

N/A

Observations Summary

Fracture Gradient	N/A
Pore Pressure	N/A
Wellbore Breakout	N/A
Tensile Failure	N/A
Drilling Parameters	N/A
Other	MW is being reduced, but still 1.38 sg.

Analysis

Drilling Experience Analysis

After RIH and washing down, took weight at 4785 mBRT. Experienced several SPP spike events while drilling down to 4804 mBRT. Encountered a tight hole at 4804 mBRT and worked pipe without rotation for 40 minutes to release the BHA. Reamed up once to 4775 mBRT then resumed drill ahead. Three hours later after the work pipe, total gas increase (~0.9 %) was observed. Below 4804 mBRT, drilling went smoothly.

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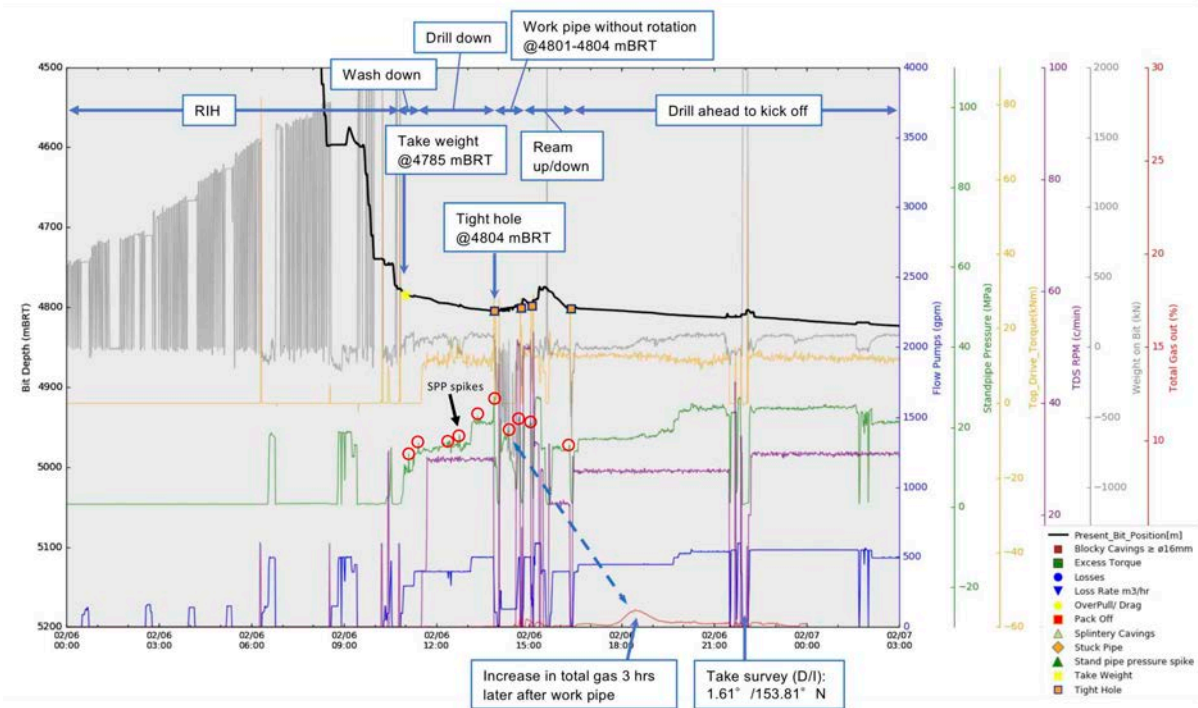


Figure 1 Drilling Experiences over last 27hrs

Cuttings and Cavings Analysis

Cement fragments were predominant until 23:30. After midnight, shaker samples became dominated by rock fragments. Most rock fragments $\geq \phi 4$ mm were angular~blocky in shape and up to $\phi 10$ mm in diameter.

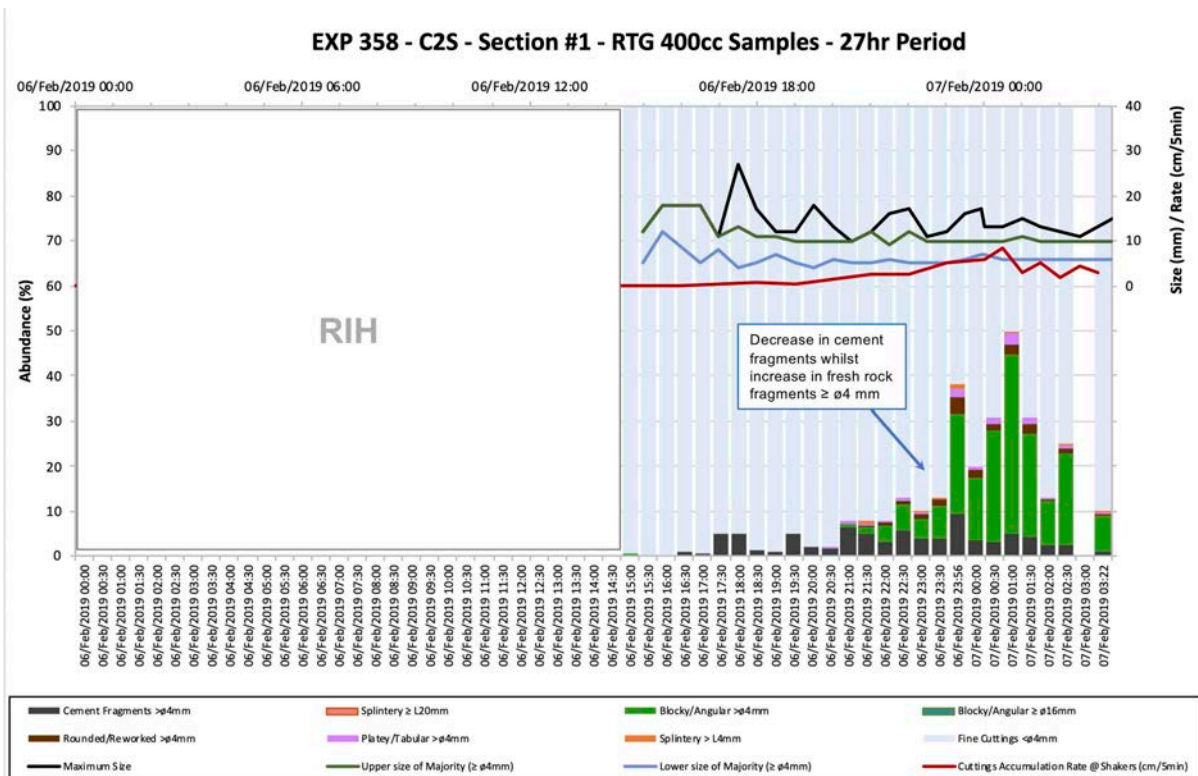


Figure 2 Occurrence of cuttings/cavings $> \phi 4$ mm (taken from 400cc RTG Samples) over last 27 hrs. Not corrected for lag time.

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Figure 3 Example of cuttings/cavings > ø 4mm (taken from 400cc RTG Samples)

LWD Data Analysis

N/A – No realtime LWD data available due to high noise.

SFIB Analysis

N/A

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Geomechanical Model Review

No change in the current stress model. Planned MW profile was slightly modified. Until reaching a depth where RSS can be activated, 1.38 sg MW will be kept.

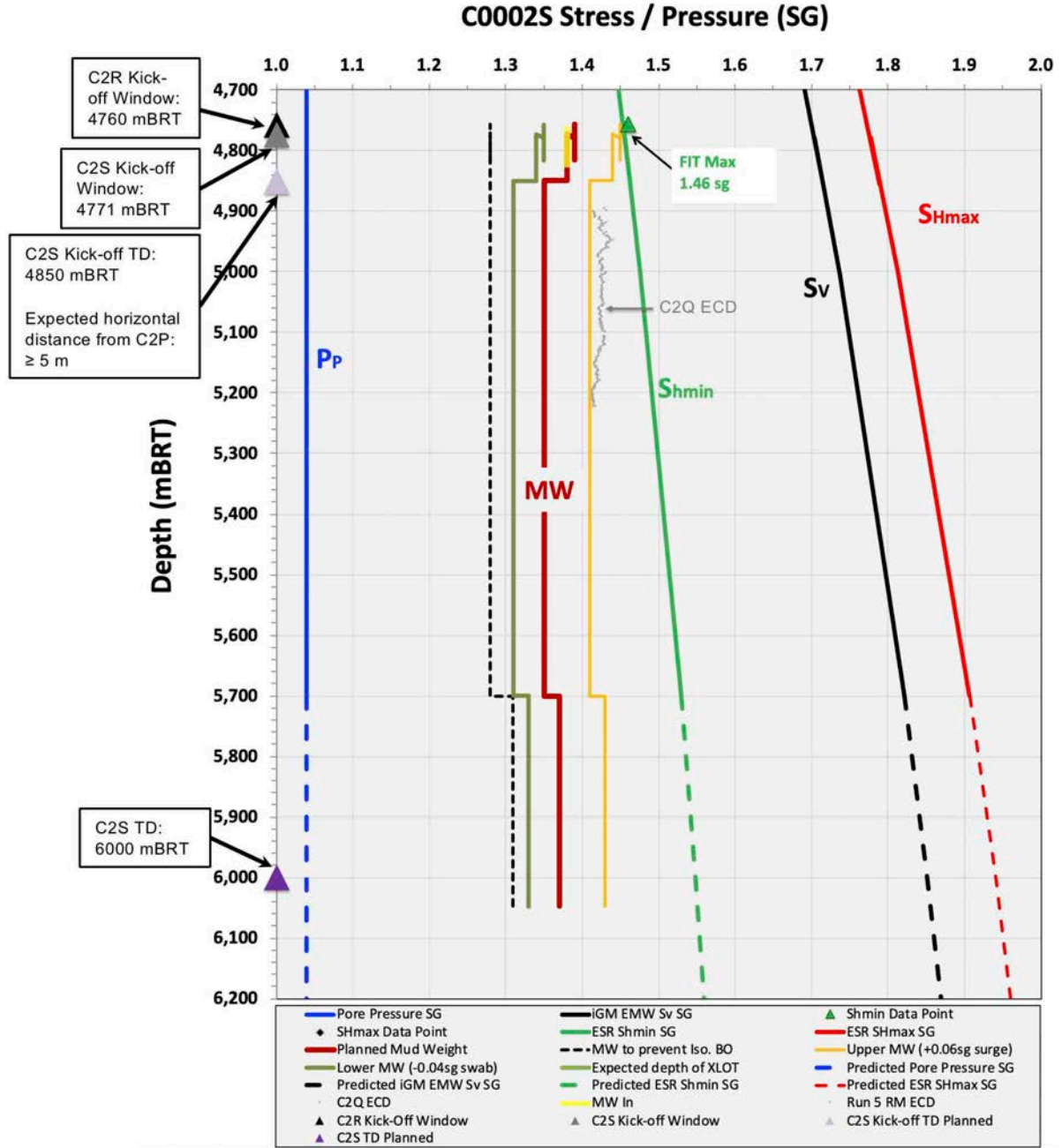


Figure 4 Current stress model for C2S