IODP EXP 358 Daily Geomechanics Report

Report #054 20190102

RTG Team

RTG Supervisor(s)	**David Castillo** / Thomas Finkbeiner / Demian Saffer
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Well Status

Site Name:	C0002		**Hole Name:**	R	
Water Depth:	1,939.0	m	**RT-MSL:**	28.5	m
2100h Depth:	5,035.4 (5032.3)	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.				

Recommendations for Cleaning C2R Kick-Off Section Before POOH

Cleaning the C2R Kick-Off section is critical for re-entering the hole to begin drilling Section #1. Due to LWD Telescope design limitations, CDEX is not able to increase the flow-rate beyond ~480 gpm because it would most certainly damage the Telescope.

RTG is recommending that additional hole cleaning practices will be necessary to better ensure the hole is clean prior to re-entering with the LWD drilling assembly. These hole cleaning practices include a greater volume of Barolift and repeated applications. The 1st application may begin when the bit is a few metres off bottom. Circulation would continue till the shakers are relatively clean.

Extra wiper trips and reaming are not necessary, especially since the hole appears to be in good condition and the bent directional drilling sub could create a key seat.

The 2nd application would occur after pulling up to about 4,830 mBRT which is where we first detected tuff within the dipping beds. Positioning the bit slightly above the tuff layers would allow any previously trapped rock fragments (tuff and/or shale) to be stired and induced to fall off any possible ledge(s). A similar high volume of barolift would be applied to remove any larger cavings.

Calculated flow rate requirements to remove rock fragments of various sizes are shown in Figure 1. The hole enlargement centered at ~4,840 mBRT would be for a 12-inch hole enlargement (left plot)

and a 14-inch hole enlargement (right plot). If rock fragments are less than a centimetre in diameter, 480 gpm should sufficient to clean the hole. It would be difficult to remove blocky fragments that are ~3 cm long using 480 gpm; however, the extra Barolift may help compensate.

The 3rd and final application of Barolift would occur after the bit was RIH to a few meters from kick off TD. If no fill is encountered, applying the 3rd Barolift application would serve to add assurance that the hole is clean. If large blocky rock fragments fell off the ledge(s) near 4,840 mBRT, this 3rd Barolift application would be the last opportunity to attempt to clean the hole.

If large blocky rock fragments remain at the bottom of the C2R Kick-Off section that were not removed using a ~480 gpm flow rate, the next LWD drilling assembly would need to clean the hole. Removing any potential fill prior to drilling Section #1 is more likely since the next LWD Telescope tool can support a higher flow rate (e.g., 600-900 gpm).

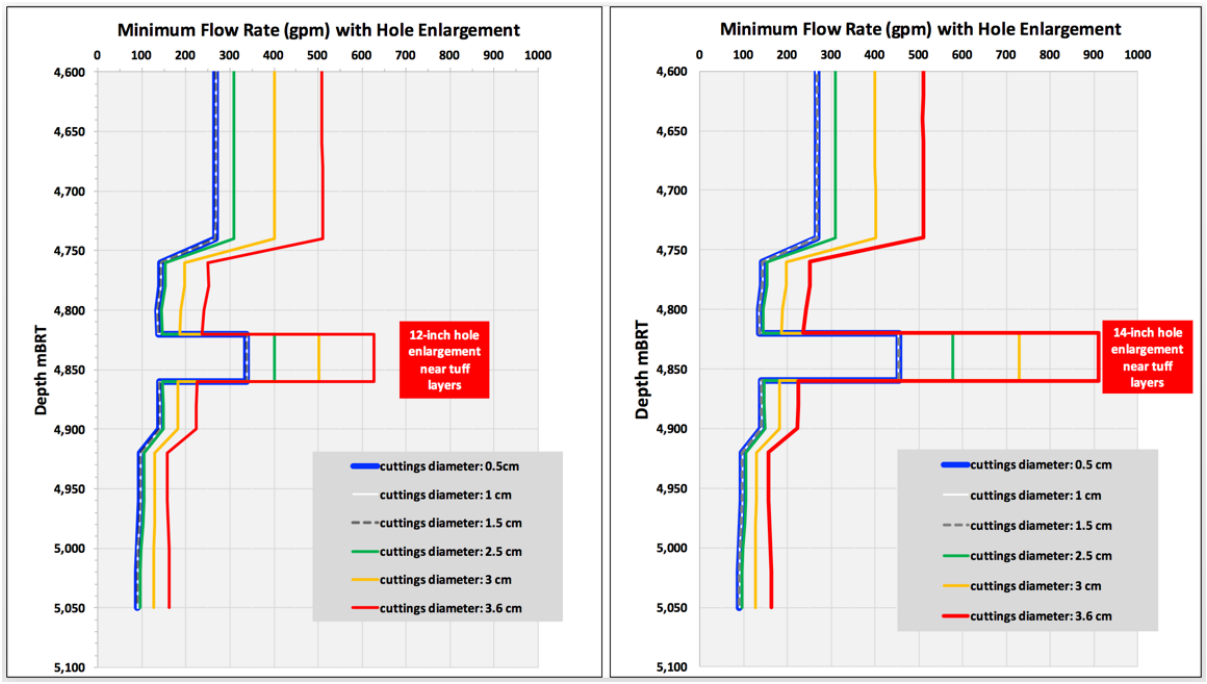

Figure 1: Flow-rate modelling for cleaning the C2R Kick-Off section for various rock fragment sizes assuming a 1.39 SG MW and a 8.5-inch hole. Modelling the impact that a hole enlargement centered at ~4,840 mBRT has on hole cleaning indicates an increase in flow rate is needed to remove large cavings for a 12-inch hole enlargement (left) and 14-inch hole enlargment (right).